

Railwan Age Gazette

FIRST HALF OF 1916-NO. 1

SIXTY-FIRST YEAR

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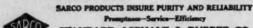
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Railway Age Gazette

Volume 60

January 7, 1916

No. 1

The circumstances relating to recent oil tank car explosion at Ardmore, Okla., are familiar to the readers of the Railway Age

Appreciation of a Public-Spirited Act Gazette. Although it was by no means certain that the Gulf, Colorado & Santa Fe was at all responsible for this disaster—in fact the report of the Bureau of Explosives seemed to place the responsibility

on an employee of the consignee of the oil-and it is likely that the railroad might have avoided the payment of damages by long drawn-out court proceedings, the railroad, through President Ripley, immediately and voluntarily offered to pay for the damage and allowed a local committee appointed by the mayor of Ardmore to adjust the claims of the sufferers. The damages thus ascertained will amount to over \$500,000. That the people of Ardmore appreciate the public-spirited attitude taken by the Santa Fe is evidenced by the following telegram received from the two newspapers of that place by F. G. Pettibone, vice-president and general manager of the Gulf, Colorado & Santa Fe: "Ardmore is at this Christmas time the happiest and most thriving city in Oklahoma and that fact is due to the manliness, generosity and humanity of the officials of the great Santa Fe Railway System. We would indeed have been spending a Christmas in deepest gloom had it not been for you. The press of Ardmore speaks for the entire citizenship of this city, when we again give our expression of thanks and send to you the greeting of the happy Christmas season. May the new year of every Santa Fe official and employee be filled with gladness."

November railroad earnings for the eastern roads at least are going to be as good, if not better than October. The Penn-

A Forecast of Earnings in 1915 sylvania Railroad earned \$18,617,000 gross in November, 1915, an increase of \$3,792,-000 over November, 1914. Net operating income amounted to \$5,062,000, an increase over the 1914 operating income of \$2,484,-

000. The New York Central November gross was \$16,023,000, an increase over the previous year of \$3,929,000 and net was \$6,107,000, an increase of \$3,747,000. Both these companies make annual reports for the calendar year. If December was comparatively as good as November, the Pennsylvania will show approximately \$45,125,000, comparing with \$35,095,000 in 1914. This is a gain of about \$10,000,000 and to this can safely be added the gain of \$3,000,000 shown in the eleven months ended November 30 in "Other Income." Subtracting from this \$13,000,-000, an increase of \$5,700,000 in fixed charges, there is a gain of \$7,300,000. This would make net corporate income for 1915 about \$41,390,000, or about eight per cent on the company's stock. This will by no means permit of the Pennsylvania's ideal of a dollar invested in property for every dollar paid in dividends, but it at any rate leaves a fair margin of safety over the six per cent dividend. On the assumption that December shows up as well as November, the New York Central will show \$167,209,-000 gross this year and \$33,228,000 net operating income. The gain of the New York Central in net is greater proportionately than the Pennsylvania's, but an exact comparison cannot be made because of the merger of the Lake Shore with the New York Central which became effective January 1, 1915. Apparently the prosperous second half of 1915 has more than offset the depression of the first six months of the year for the eastern roads. If 1916 shows a full twelve months of such earnings as the last six months in 1915, the eastern roads will be back on a sound basis of earnings providing they are let alone by labor and government.

The state of Georgia, which must reopen the problem of its Western & Atlantic property when the lease of the line to the

A State Monopoly in Transportation Nashville, Chattanooga & St. Louis expires in 1919, is already agitating itself in the newspapers. A company proposing to build a parallel railroad has been complaining for over a year that the of-

ficers of the state, in their zeal to protect the state road, are perpetrating an outrage on the constitution in refusing to grant customary rights and privileges to the newcomer. Not in the least moved by this, the state has grown still more intolerant of competition; and the Louisville & Nashville, which brings forward another parallel proposition, has been forbidden to announce its purpose in the newspapers! The Cherokee circuit of the Superior Court, at Cartersville, has issued a temporary injunction restraining three newspapers from printing the road's legal advertisement. When railroad builders with good money in their pockets are forbidden to spend that money to give the people of the State additional railroad facilities without tapping the public treasury, Americans will surely believe they have come upon evil days. Evidently the lawmakers of Georgia believe in monopoly, in one narrow section of the State, at least.

To see the peculiarities of state railway operation it is not always necessary to go to Europe, or South America; Canada is an in-

Governments as Railway Managers creasingly interesting field, with frequent humorous features. The National Transcontinental is in a rather cold climate—300 miles north of Toronto—but they are proposing now to use it as a winter route

for carrying to the Atlantic seaboard the enormous wheat crop of the western provinces; and the rate, "tentatively announced," from Armstrong to Montreal, is to be six cents a bushel. Armstrong is at about the longitude of Port Arthur and the rate is intended to be about equal to the water and rail rate which is in force from that port in the summer. As the distance from Armstrong to Montreal is about a thousand miles, the tentatively proposed rate works out about two mills per ton per mile. The line has very little other business, and the taxpayers of Canada may be pretty sure that Jack Frost will see to it that the grain traffic does not work any startling reduction in their railway burden-if, indeed, he does not increase it. However, it may be that a chief feature of this rate is its tentativeness; "feeling" the public is often necessary in state management, whether of railroads or anything else. Using a new railroad to compete in freight rates with the giant water carriers of Lake Superior will be an interesting experiment, at all events.

As a means of encouraging the users of material and the various storekeepers over the entire system to maintain the stock

E Monthly Statements of Stock Balances carried at a practical minimum, C. H. Rost, general storekeeper of the Rock Island, has originated the idea of sending monthly statements to the division superintendents, master mechanics and store-

keepers on the entire system, showing the amount of stock carried at the various storehouses. These statements are divided into two lists-one covering the roadway stock and the other that used by the mechanical department. Each list gives the amount of stock carried, the number of days' stock, the increase or decrease and the percentage of the issue for each division or store. The division or storehouse is rated according to the number of days' stock carried, and the lists are separated further to show those above and below the average. It is the purpose to show those responsible for the stock just how they stand in relation to the other divisions and storehouses. While the scheme has only been in effect for a short time, it has been found that the storekeepers are anxious to improve their rank, and have been reporting such material as has not moved, so that it can be transferred to other points. During the six months from January to June there was a decrease of 38 per cent in the number of days' stock carried in the roadway material and also in "other" material. The proper comparison, of course, would be with corresponding months of different years, but from the information obtained thus far it is expected that it will show substantial improvement.

STARTING RIGHT IN HANDLING L. C. L. FREIGHT

CONTRARY to first thought, the problem involved in the handling of L. C. L. freight safely and expeditiously is not confined to its care between the time it is delivered at the outbound house of the road and the time it is turned over to the consignee at destination. Under present methods, the roads assume the responsibility in large measure for the condition in which freight is delivered to them by the shipper through their control of the regulations for the preparation for shipment of the various commodities. Not all the claims which the roads pay originate because of faults of theirs. Many are caused by freight being received which is improperly marked or insufficiently prepared for shipment, or is damaged while on the way to the freight house.

As a road is generally called on to pay all claims not definitely located elsewhere, its interest in this problem should begin in the warehouse of the shipper. Essential to any study is an investigation and analysis of conditions. This involves the tabulation of the claims showing the materials, the nature of the losses and the firms involved. With this information the local agent and freight solicitors are in a position to point out to a shipper the defects in his shipments. Few shippers desire that their shipments should go out in other than good condition. They will therefore generally be found willing to co-operate with a road in overcoming evident defects in their practices.

From the nature of their duties and their experience the local agent and his staff become expert in handling package freight of all kinds and they can be of real assistance to a shipper by suggesting to him ways in which he can prepare his freight to withstand the abuses incident to shipment. Furthermore, a road whose employees show this interest in its patrons will profit in the solicitation of competitive traffic as compared with one which shows no such interest, for no matter how promptly a road may pay its claims, any shipper is more interested in having his goods reach his customer in proper condition than in collecting claims for freight which was not delivered, or which was damaged in transit. On those roads which have given this subject the most attention it has been found that much direct benefit can be accomplished by securing the co-operation of the patrons. If freight is properly prepared for shipment a road has the means within its own power to correct abuses due to careless-

ness or rough handling. Freight properly prepared for shipment is well started on its way and the roads can well afford to cooperate in securing this condition.

CLEARANCE LEGISLATION

CLEARANCE legislation is again becoming a subject of live interest. Representatives of the railway brotherhoods are planning to urge Congress to take action on this question this winter. The Illinois Public Utilities Commission has announced a final conference for January 10, to discuss its regulations issued last spring. The subject is also being agitated before the railroad commissions and legislatures in other states. It is the recognized duty of a railway to adopt all reasonable means to safeguard the lives of its employees, and the organization of safety bureaus, the promulgation of safety-first campaigns and the large expenditures made to remedy defective conditions in recent years have shown the responsibility which the railways have assumed in this regard.

The enactment of any legislation presupposes a practical knowledge of the purposes and effects of such laws on the part of those responsible for them. A study of the orders and statutes in effect and proposed to regulate clearances shows that this condition has not existed in most instances. It is obvious that the clearance between equipment and structures depends on the relative dimensions of the two and that to limit one while ignoring the other is illogical and leads nowhere. Yet the order of the Illinois commission and the regulations of a number of other states do this very thing by fixing the minimum dimensions of structures while making no mention of equipment. The only result of such legislation is to afford an opportunity for car and locomotive designers to increase the extreme dimensions of new equipment until in a few years conditions will be exactly where they were in the beginning so far as clearances are concerned. It should be evident to everyone that when establishing clearances it is necessary to fix the maximum dimensions of equipment as well as the minimum dimensions of structures to maintain the desired space between the two.

It should also be remembered that the purpose of clearance legislation is to establish maximum dimensions of cars and minimum limits for bridges and not average dimensions, or those which might be recommended as good practice. The greatest clearance between a car and a structure which has ever been suggested is 3 ft. and some states require only half this amount. In spite of this fact the Illinois commission has specified a minimum horizontal clearance of 17 ft. at a time when 95 per cent of the equipment operating within the state is less than 10 ft. 2 in. in maximum width and practically none exceeds 10 ft. 6 in. To establish such a figure as a minimum is unreasonable and cannot be sustained by necessity. The fact that the state has specified a minimum clearance for structures will not prevent any road which so desires from exceeding these dimensions and many roads will increase them over all or a large part of their lines. However, there are some points where the use of other than the minimum dimensions will be very expensive if not entirely impractical.

There is coming to be an increasing realization of the fact that as a practical matter clearance legislation should not affect existing structures except within very broad limits. At the present time on many roads, particularly in the East, there are a large number of tunnels, bridges and other structures which will not comply with any clearance limits likely to be established, but the cost of revising them in a short period to bring them into agreement with such proposed standards would be so great as to render the entire clearance program financially impossible. With only a few exceptions, railway structures and equipment are entirely rebuilt every 20 or 25 years. If proposed clearances apply only to new construction, almost the entire railway property will thus be brought in accord with such regulations in this period and the few remaining obstructions can then be revised at a relatively moderate expenditure. In this way the desired

result can be secured in a practical manner. This was the method followed in the installation of air brakes and it is applicable here.

For practical operating reasons clearance regulations established by an individual state cannot terminate at its boundaries but must at least be maintained to the next division terminal beyond the state line if not over the entire system. When the Indiana order went into effect a few years ago, some of the roads found it necessary to extend those same standards over their lines in Illinois. If the more drastic Illinois regulations now go into effect it will be necessary for these roads to again revise their structures not only in Illinois but in Indiana as well. Also with the universal interchange of equipment throughout the country the wide diversity of requirements regarding both equipment and structures cannot help but lead to endless confusion and unnecessary expenditures without securing the desired results. The solution of this problem, as of other problems of railway operation, lies in its concentration in the federal government. In the meantime, the railways can do much through their engineering and mechanical associations to formulate standards of their own and to harmonize the existing conflicting conditions on different roads. Up to the present time the railways have prepared no such standards, with the result that there is no harmony either of ideas or of design. If the railways will give this problem the attention it deserves and establish and put into effect reasonable standards on all lines, much of the present agitation can be eliminated and needless expense avoided.

LITTLE SERMONS TO STOCKHOLDERS

THE nefarious practice of paying dividends has gone out of fashion on many of our best-regulated railroads. Some roads retain the time-honored custom, however; and, possibly having in mind that many people's interest can be best aroused through the medium of the pocketbook, certain of them have adopted the plan of enclosing with their quarterly or semi-annual dividend checks little slips on which are printed brief messages to the stockholders bearing on some aspect of the railroad situation.

The Santa Fe, with its December dividend, sent out the following: "You are one of about forty thousand owners of the shares of the Atchison, Topeka & Santa Fe Railway. As such, use your personal influence for fair treatment of American railroads. Do what you can to secure reasonable rates, equitable taxation and intelligent legislation." In sending out its September dividend the same road added to the announcement of the annual meeting a note saying that "the fact that stockholders of large corporations seldom attend meetings or exercise the right to criticize the management, or otherwise express opinion, is often commented on unfavorably and is sometimes claimed to be responsible for instances of mismanagement resulting in disaster," and that "any stockholder has the right, and is hereby requested to make, either in person at the meeting or in writing, such suggestions or criticisms as may appear to him for the advantage of the company." The management of the Pennsylvania Railroad, which has over 90,000 stockholders, has occasionally taken advantage of a similar opportunity to address them.

These two companies have the largest numbers of shareholders among the railroads of the country, and are pre-eminent examples of companies whose stock is not controlled by any particular group of financiers, but is distributed among a multitude of persons whose average holding is small. Their stockholders are, therefore, much more closely affiliated with the general public than with the class of railroad "magnates" that the public has been taught to believe are the owners of the railroads. There are many other roads of most of whose stockholders the same thing may be said.

Not only is the time of the arrival of the semi-annual or quarterly dividend an especially favorable psychological moment for seeking to arouse the interest of the stockholder in the affairs of his company and in railroad questions generally, but as there are over 625,000 railroad stockholders this plan affords an unusual opportunity for gaining the attention of a very considerable part of the general public.

Moreover, until a law is passed requiring stockholders to call in person for their ill-gotten gains, the plan of making the dividend postage pay the freight for an appeal to the public is an example of efficiency not to be ignored in these days of rigid economy. The postage required to mail the Pennsylvania's 90,000 dividend checks four times a year amounts to \$7,200, to say nothing of the part of the cost of transporting this mail for which Uncle Sam does not pay.

The railroad dividend might be entirely obsolete by this time if railroads had not learned the efficiency of increasing the freight trainload; and it is in line with the same policy to fill out the tonnage of the lightened dividend envelopes at least with company freight. As for the holders of the 35 per cent or more of the outstanding railroad stock that does not pay dividends at all, it is likely that they do not need to be urged to take any greater interest in the needs of the railroads. It is their only substitute for interest on their investment.

ECONOMY OF ALTERNATING CURRENT IN SIGNAL WORK

THE ability to operate track circuits successfully on a section of line presenting almost insurmountable difficulties to direct current circuits was the essential advantage derived by the Grand Trunk through the use of alternating current in the signal installation near Chicago, described elsewhere in this issue. On a number of roads, notably the Pennsylvania, the New York Central and the New Haven, the use of alternating current for track circuits has been necessary on some lines because of the adoption of electricity for propulsion. On some far western roads the possibility of maintaining an alternating current signal installation with a smaller number of men than is practicable when direct current is used, has been one of the most important considerations in planning signal work on the lines through desert country, in which it is very difficult to get men to stay. Various combinations of these and other considerations, such as immunity from foreign current troubles, and the incidental uses of power from the signal transmission line for lighting, etc., have entered into the decision on the many other roads that have tried alternating current signaling on steam-operated lines.

While the inception of this system dates back only a little more than a decade, its use has been widely extended and every indication at present points to its still more rapid adoption in the future. Since the alternating current is absolutely essential on electrified lines, numerous instances of the replacement of direct current signaling on account of electrification are to be found, and such work may be expected to become increasingly common with the extension of heavy electric traction.

Two notable signal installations, one on the Pennsylvania and the other on the Norfolk & Western, have recently been changed from direct current to alternating current, on this account, and a third, on the Chicago, Milwaukee & St. Paul, is now being changed. The cost of such replacement makes it important to give careful consideration to the possibility of future electrification on any line for which a signal installation is proposed. This is clearly indicated by the statement in the report on smoke abatement and the electrification of steam roads in the Chicago terminals, recently issued, that it would cost nearly \$7,000,000 to make the necessary changes in the 800 miles of automatic signals and the 131 interlocking plants within the electrified zone. Further, with the constantly decreasing cost of electric power and the increasing number of localities in which it can be secured, the installations in which the lower operating and maintenance costs of an alternating current system will not more than offset the increase in first cost, are becoming fewer and fewer.

Letters to the Editor

RECEIVERSHIPS IN THE SOUTHWEST

NEWTON, Kan.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Referring to the article, "Why Texas Railroads are in Receivers' Hands," page 1053, Railway Age Gazette, December 3. Henry N. Pope, president of the Farmers' Union of Texas, through the medium of the Texas newspapers, called on men who manage railroad properties to "speak out" as to the responsibility for railroad receiverships in the Southwest. C. E. Schaff, receiver of the Missouri, Kansas & Texas, and W. B. Scott, president of the Sunset-Central Lines, "spoke out," and their answers were quoted in the issue referred to.

It is encouraging to see a man of Mr. Pope's evident standing thus solicitous. Now that replies have been made, the query in the mind of the average layman is, what is Mr. Pope going to do about it?

A. C. HASKELL

Chief Clerk to General Superintendent, Atchison, Topeka & Santa Fe.

COLD STRAIGHTENING OF RAILS

CHICAGO, Ill.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In discussing the hot and cold straightening of rails some misapprehensions seem to exist indicating that a brief description of the method usually employed in making rails straight will be of interest. When the work of rolling has been finished, the rail bar is sawed into the proper rail lengths, each rail is stamped with the heat number and letter and it is then run through the "cambering" machine. This generally consists of two horizontal rolls bearing on the web of the rail, while vertical rolls press on the head of the rail on both the entering and discharging sides of the stand. The vertical rolls screw in and out, and obviously, on the pressure by which they bear on the rails depends the amount of the sweep or curve, which the finished rails contain. Practice dictates about what this curve must be in order for the rails to be nearly straight when cold. It will be noted that straightening for surface only is thus provided for, it being assumed that the rails will be straight in line.

The rails are then skidded mechanically or "pulled up" on the hot beds in lots of perhaps three or four, the head of one bearing against the base of the other; they are then "spaced" by a man who applies a long wrench to one end of the rail. While it is necessary to provide for movement of the rails as they cool, this method of spacing is in itself objectionable, as the jerking motion imparted to the hot rails tends to destroy both line and surface by inducing kinks and short bends. After the rails have cooled and drawn practically straight, but while they are still red hot, the workman with the wrench turns them so that the side first down is brought up. They remain in this position until sufficiently cold to be handled easily when they are moved to the cold straightening presses. There the straightener, holding the rail at the end, moves and turns it as desired while sighting along it and signaling in the meantime to the "gagger" at the press when to apply the gag and permit the ram of press to deliver its blow. Thus, the rail is bent according to the straightener's desire, but the amount of bend actually made depends largely on the gagger, who regulates the force of the blow by inserting the gag under the inclined surface of the ram to different degrees, according as a light or heavy blow is desired. Rails not considered sufficiently straight when inspected are marked for restraightening, which means that additional cold straightening has to be done, to the extent of correcting the deficiencies found.

While apparent and important defects exist in the practice of hot straightening, attempts toward improving conditions permanently have not as a rule been seriously considered. This is probably largely because the specified ultimatum that "rails must be straight in line and surface" is, under present

conditions, a positive demand for work in the gagging presses and, as the workmen are now paid, any improvement in hot straightening would merely tend to increase the cost of production without materially affecting the amount of cold straightening necessary. In short, there is not the same inducement toward an effort to obtain better hot straightening as would result if rails could be accepted without undergoing the expensive cold straightening when they were only a little off. Better hot straightening would result from having the cambering machine regulated for each individual rail, according to its location in the ingot and its apparent temperature. Rails ought to be pulled up on the hot beds one at a time and carefully spaced without jerking on one end. They should be turned on the hot beds probably twice instead of once. Hot beds should be amply protected from draughts and a better circulation of air induced. In fact, the hot beds should be larger and provided with some form of mechanical conveyors to insure proper spacing and to turn the rails automatically. These operations should all be carefully done by painstaking, intelligent workmen.

The question is often asked as to how nearly straight rails are as they come to the cold straightening presses. The following table will give some idea as to this, as well as to the number of blows required to straighten the rails actually measured. The same section of rail was observed in both instances, but rails containing hooks or short bends were not counted, as, of course, such are eliminated from any consideration of the subject:

Total number of rails measured.	1	Mill A			Mill B 100	
Amount of middle ordinate	Nun		ails	Nu	nber of	rails
(inclusive)	Head low	Head high	Side	Head low	Head high	Side sweep
0 to 1/4 in. inclusive	. 5	6	14	0	0	0
1/4 in. to 1/2 in. inclusive		6	18	0	0	0
1/2 in. to 3/4 in. inclusive	. 5 .	7	11	0	6	10
34 in. to 1 in. inclusive	. 5	4	15	59	4	63
1 in. to 11/4 in. inclusive	. 10	4	9	31	0	27
Over 11/4 in	. 13	0	5	0	0	0
Maximum	23% in.	11/4 in.	13/4 in.	11/4 in.	1 in.	11/4 in.
			-	-	-	_
Total		27		90	10	100
Average middle ordinate, in.			.677	1.04	.787	.996
Number of blows necessary	to straig	ghten—				
Average				10.7		10.4
Minimum				4		15
Maximum				16		15

The above measurements for unstraightened rails were taken while they were resting on skids about 20 ft. apart, so that the amount of sag created by a rail's own weight is included. It has been found that a 90-lb. ARA type A rail when resting on a flat surface in workways position, loses about 3/8-in. of this surface sweep, so that it is safe to say that only about eight per cent of the above rails would actually contain a surface bend of one inch or more when ready to lay. Such rails can be spiked to good track surface by using six spikes on three different ties. Probably most railroads start bending rails for 4-deg. curves, and a middle ordinate of 11/8-in. in a 33-ft. rail is then desired. Thus, only about 23 per cent of the above rails contained a line sweep greater than would ordinarily be given to rails without prior bending when being laid on curves. To actually straighten these rails required an average of 10 suddenly-applied blows per rail, while the maximum was 16. Each blow in the cold straightening press bends the rail beyond the elastic limit, and is in effect a similar operation to breaking a small piece of metal by bending it back and forth in one's fingers.

Experience with some shipments that have been made of unstraightened rails shows that there is no difficulty whatever from inability to pile them properly in any manner desired. It should be emphasized that only rails with long uniform sweeps are being suggested as possible of acceptance without cold straightening. In surface these might be either head high or head low and a single rail might also contain some side sweep. What the possibilities are of using such rails in the field is a matter for the railroad engineers to decide, and in arriving at a conclusion they should remember the fact that probably 75 per cent of the rails of modern sections could be passed for acceptance without the damage of cold straightening, if a limit of one-inch sweep was permitted.

C. W. Gennet, Jr.

Robert W. Hunt & Co.

Starting Right in Handling L. C. L. Freight, Traffic

The Importance of Preparing the Parcels Properly for Shipment Before Delivering Them to the Road

The following papers received in the contest on The Handling of L. C. L. Freight* emphasize the importance of having freight properly prepared for shipment by the consignee before delivering it to the freight house.

STARTING FREIGHT RIGHT TO AVOID CLAIMS

By Wm. L. Burt

Assistant Freight Trainmaster, Pennsylvania Railroad, Jersey City, N. J.

The duty of the railroad in handling L. C. L. freight, as with all other traffic, lies in transporting it from the shipper to the receiver promptly and with due care. There are conditions, however, which may entirely negative all efforts exerted by a railroad in accomplishing this end. At the originating point improper and unsafe packing or rough handling before delivery to the railroad will, of course, lead to damage and claims. The effects of this may not be apparent at the time shipments are received; nevertheless they exist in no negligible degree. The first steps for reform should, therefore, begin with the originator of freight to see that it is properly and securely packed before delivery to the carrier. The same thing may be said in so far as the handling of the shipments at destination is concerned. Damage frequently occurs after the delivery of a shipment to the consignee, which may not be developed until the shipment is unpacked, when a claim is made against the carrier for damage for which it is in no way responsible.

It is not the intention of the writer to infer that this is the only cause of damage nor that the carriers are beyond criticism in the handling of freight, but it is necessary to start right in order to enable the railroads to do their share. The subject is not so much one which calls for the adoption of new rules, methods, etc., as it does for the enforcing of those already in existence. Every railroad employee whose duty connects him in any way with this class of traffic is, or should be, thoroughly familiar with the requirements of his position, and the complaints of the unsatisfactory service in the handling of L. C. L. freight are an admission that the existing rules are not being observed, that there is not sufficient team work between the shippers, railroads and consignees, or that there is not the proper supervision of the entire operation to obtain the desired result.

The next step of importance is the selection of a proper car. It should be cleaned and all protruding nails, spikes, etc., either driven in or withdrawn. This is an important precautionary measure and failure to observe it results in damage to shipments and consequent claims. A strenuous campaign of education carried on along this line will be found to be of immeasurable benefit. Receiving agents should make full and prompt reports of all such cases and the attention of the loading agent should be called to the damage resulting from failure of his station force to observe the rules in this respect. A strict observance of inspectors' shop marks is also important if unnecessary delay to the freight is to be avoided. Failure to take this precaution results in the defective car being drilled to the shop track for repairs after it is loaded, resulting in delay and also probable damage to contents by reason of the necessity of shifting the lading to make repairs.

The ideal method of handling outbound shipments is to move them by one operation direct from the shipper's truck to the car. Theorists will claim that the ideal freight station should be so constructed as to give the shortest possible haul between the receiving point and the car. If ideal conditions always existed in railroad operations the theorists would be correct, but all practical men know that such conditions do not exist. One of the best forms of card manifest is shown in the illustration. This provides space for the original car number, the car into which the shipment may be transferred; also the record of handling from the point of shipment to destination, and the final placing and delivery to consignee. The front of the card is retained by the agent at destination, or forwarded to the auditor, according to the prevailing practice. The back or duplex portion is detached at the perforated line and forwarded to the superintendent of freight transportation or other proper official. This detached portion gives a detailed record of the handling of the shipment from consignor to consignee. The

Car Marker of to Car Mat	0	MERCHANDISE PREIGHT Record of movement of car. Prom. To. Date.
FFOMpate		Car No
NORTH & SO	Collect:	Transferred to
Weighed at	Actual weight Grosslbs. Tarelbs.	
The forwarding agent spaces at the head of The duplex must not be the car has reached i conductors handling o proper space the time train. At destination will note date and till Roceiving agent will	the duplex ticket te detached until te destination. ar must note in of departure of the yard master me of arrival.	Departed from
placed at Treight hour for delivery, detach; warding it promptly te ent Freight Transport	re and time ready on duplex and for- on the Superintend- ation.	Placed at houseDate. Time

A Complete Card Manifest Record

point where any delay occurs is located at a glance. This form of card waybill for merchandise freight offers a system of almost automatic supervision, as everyone handling it is anxious not to record a delay while in his jurisdiction.

The improper stowing of freight and the rough handling of cars in transit are responsible for a great many damage claims. There must of necessity be a certain amount of shock in transit in the normal yard and road movements. To prevent the shifting and consequent damage to shipments from such causes, it is necessary to adopt an intelligent method of stowing. For example, boxes, crates, bundles, barrels, etc., should be stowed longitudinally with the car and on their flat surface, when such exists, in order to furnish the greatest resistance to shock. Care should also be exercised to see that the shipments of greatest weight are placed at the bottom of the car, while those of lighter weight or of fragile nature, are placed at the top.

Care should also be exercised to obtain a uniform distribution of weight in the car. A number of accidents and derailments

^{*} The two prize winning papers received in this contest were published in the issue of November 26, page 1005.

have occurred by reason of failure to observe this precaution. If the doorway space is not used, the nearest packages should be securely braced. If loaded in tiers, each tier should be "stepped down" and securely braced so that it will be impossible for packages to fall from their original positions.

There should, of course, be an established closing hour for the receipt of freight. After all shipments received have been loaded a period not exceeding 15 minutes should be allowed before the cars are sealed, to enable qualified stevedores to inspect each car to see that shipments have been properly stowed and secured in order to guard against reasonable shocks in transit. After the cars are sealed and are removed from the station the responsibility of the forwarding agent ceases.

The outbound car from the point of shipment necessarily becomes the inbound car at destination and the discussion of the inbound is consequently a continuation of the outbound subject. The operating organization should have a detailed report of every train in advance of its arrival at a station or terminal in order to determine just what disposition is to be made of the cars when the train arrives. In the case of perishable and market freight the prompt handling of waybills from the conductor to the yardmaster and from the yardmaster to agents is of supreme importance, as every minute of delay in the handling of this mail results in unnecessary delay in the placing of the cars. At large terminals a great saving in time may be effected in the handling of mail and the placing of cars by the installation of pneumatic tubes, which enable conductors to despatch their mail to the yardmaster's office as soon as the train reaches the outer limits of the terminal and the yardmaster to make prompt disposition of the waybills after they have been checked. One hour should be the maximum time allowed for the placing of merchandise cars at a station under normal conditions, except when such placing requires a movement by float or lighter, when the time of placing must necessarily be extended.

THE IMPORTANCE OF SYSTEMATIC ARRANGEMENTS FOR THE RECEIPT OF FREIGHT AT THE DOOR

By H. W. Davies

Central of Georgia, Savannah, Ga.

The economical handling of freight at a large less-than-carload forwarding station involves considerably more than the organization of a competent force of checking and loading clerks and freight handlers. While the organization calls for thought, skill and application to meet the varied requirements at different points, it constitutes but one, and in some cases among the least, of many important problems encountered at all large forwarding stations. The defeat of proposed improvements is generally the result of the shippers viewing the subject from one angle and the railroads from another. Both are sincere in their purposes and efforts, but each lacks a proper analysis, and consequently a full or fair understanding of both sides of the question.

It is not the purpose in this article to deal with the question of cost of handling freight in the freight house, but rather with conditions affecting the handling of the freight up to the time the freight reaches the freight house. To cite a case or condition of fact in an argument or presentation of a subject always serves best to prove a conclusion, for which reason I shall state a condition that actually existed at a large and important forwarding station, the difficulties connected with which were fully overcome to the mutual satisfaction and benefit of the shippers and the railroad resulting in a highly improved service at a greatly reduced cost to both.

The station in question consisted of a forwarding freight house and a delivery freight house each about 500 ft. long, separated by 6 tracks, 4 belonging to the forwarding house and 2 to the delivery house. From about 10 a. m. until 1 p. m. the delivery yard was crowded continuously with teams after inbound freight, the yard frequently being so blocked as to retard and prevent the departure of loaded teams. During these hours of constant rush at the delivery house, practically

no outbound freight was delivered at the forwarding house; the teams returning empty to the delivery house for another load as soon as one load was delivered to the consignee, and making from two to five empty trips back to the delivery house for a distance of about 2 miles in 40 per cent of the cases. From 2 p. m. on very little freight was delivered and practically none after 4 p. m.

From 12 o'clock outbound freight began to arrive at the forwarding house in small and straggling lots, gradually increasing about 3 p. m., until between 4 p. m. and 5 p. m. a constant stream of heavily laden wagons poured into the yard, with the result that at 5 p. m. the yard was crowded and blocked beyond the yard limits into the streets, making it difficult for the teams to get away from the doors when unloaded to allow others to come up. The situation can be best realized when it is stated that with 5 check clerks and about 25 truckers (at this time two clerks and the necessary truckers were engaged in transferring freight from the warehouse floor into cars) the yard was seldom cleared before 7 p. m., more frequently not before 7:30 p. m., and occasionally not before 8 p. m. The result was that the loading of outbound freight was seldom completed before 8 p. m. and frequently not before 9 p. m.

There were three outbound freight trains, one a through train, leaving about 6 o'clock; one, an express or intermediate train, leaving about 7:30 o'clock, and the other, a local train, leaving early the next morning. Cars for the through train had to be ready for the shift at 5 p. m., and those for the express by 6:30 p. m., which meant that all freight received after 4:45 p. m. for distant points forwarded by the through train and all received for the intermediate points after 6 p. m. had to be stored on the warehouse floor over night and then loaded into cars the next morning. This meant 24 hours delay to all such freight, which constituted about 40 per cent of the total through and intermediate freight. This defeated the shippers' desire for prompt delivery at destination and doubled the cost of handling for the railroad, while at the same time it increased the railroad fire risk, and also the risk of loss and damage claims.

Varied attempts had been made to improve the situation without success until the matter was handled in an impartial and practical way from the standpoints of the shippers, teamsters and the railroad. A pamphlet was circulated among the manufacturers, wholesale shippers and teamsters setting forth the conditions as they existed, and explaining how they worked against the interests of all concerned—to the shippers by delay to their freight, and to the teamsters by delay to their teams in congested yards and by lost motion when making empty movements when they could have been hauling loads each way, all of which reduced their efficiency and increased their cost of operation. The pamphlet set forth the territory and the principal points to which the through and the express trains handled freight, the leaving times of these trains, and the latest times at which freight could be received in order to be forwarded by them.

The co-operation of the shippers was solicited to the extent of having their shipping clerks put up their shipments and make deliveries as early in the day as possible, giving preferred movement to the freight for the distant points to move by the through train, and next to the freight to move by the express train, while delivering the local freight last, all of which could be facilitated by requiring the teamster to take a load of freight to the outbound freight house each time he brought a load from the inbound house in the morning and bringing a load back from the inbound house each time he took a load to the outbound house in the afternoon.

A number of the large shippers and teamsters saw at once an advantage to be gained for themselves by the new plan and immediately put it into effect. As was to be expected, however, a number of the shippers, and especially the teamsters, paid little or no attention to the circular, some even offering objections. The circular was followed up immediately by an active campaign of education; the entire agency force, as well as soliciting agents and employees of the general offices, calling on and explaining in person to the shippers, shipping clerks and teamsters on every opportune occasion the benefits to be gained. A decided improvement was observed within a few weeks; and as soon as a few of the private teamsters saw that their collections had increased while their teams worked less hours, they made the fact known to other teamsters, with the result that it was not long before the private teamsters were the strongest supporters of the new plan and contributed much to its success by their support.

The soliciting agents saw a good argument for increasing traffic in the 24 hours time saved and consignees detected the improvement in time. In due season all the shippers fell into line, giving preferred movement to the more important freight in keeping with the schedule furnished in the circular, with the result that after about 6 months' trial, where formerly the forwarding yard was crowded as late as 6:30 p. m., the yard was now invariably cleared of all wagons by that time; and where formerly from 60 to 80 tons of freight was carried over night on the depot floor to be rehandled the next morning the average was less than 15 tons.

At this time the situation was further improved by placing a competent man at the entrance to the yard as soon as the heavy movement began each day, whose duty it was to glance over the bills of lading to ascertain for what points the wagon contained freight and to mark on them the number of the door to which he should drive to unload his freight with the minimum trucking distance to the car. The teamsters saw an advantage to them in this, for their teams could then be released in less time.

The foregoing arrangement was carried out successfully at a large station, where it resulted in a considerable reduction in the labor roll, admitted of more reasonable hours for the clerks who, in the absence of constant rush and congestion, gave more efficient service, and considerably reduced the number of short, over and damaged reports, corrections against erroneous billing, etc., all of which in turn further reduced the clerical work and created a general atmosphere of satisfaction among all employees.

SOME IMPROVED METHODS

By Don M. Neiswanger

Trading Agent, New York, New Haven & Hartford, New Haven, Conn.

The first necessity in successfully handling L. C. L. freight is that it be properly packed and correctly marked. A very important work can be done in educating the shippers to the importance of this proposition. Perhaps it is felt that it is up to the railway through its receiving clerks to see that shipments offered for transportation are properly prepared, as required by the classification and tariffs covering. As a practical matter this is often not possible, as anyone who has seen L. C. L. freight pour in at a busy terminal between the hours of 3 and 5:15 in the afternoon, will testify. Teamsters dump the goods on the platform and the receiving clerks make a hurried check as they sign for the shipment. Loading is likewise rushed and it is difficult to give shipments the thorough inspection necessary to locate shortcomings.

The classification, due to the pressure of commercial interests, also permits conditions detrimental to the safe handling of freight. An example is the improper use of fibreboard and similar cases, which is apparently increasing. Then, too, the rapid increase in the price of lumber has caused many concerns to use second-hand cases, many of which are not strong enough to carry their contents safely. These second-hand cases are also objectionable because old marks are frequently not removed. If shippers fully understood the benefits of secure packing and plain marking, they would co-operate with the railway simply because it is better business from their standpoint. A great many progressive distributors have already arrived at this conclusion; many others need only have the situation explained to

see that the added good will from the customers, plus the time and money saved through avoiding loss and damage, will more than offset the slightly higher costs of proper preparation. So we, on the New Haven, have instituted a campaign of talking it over with the shipper, showing him where both of us gain by proper packing and marking. This interviewing is done by men who are experts in all phases of the freight business.

The New Haven has developed a department in railway organization known as the Department of Station Service, in charge of a superintendent, reporting to the general freight agent on traffic and the general manager on operation. The purpose of the department is to improve the handling of freight in every possible manner; the more important of its specific duties are to see that actual weights are furnished on all shipments and that the same are properly classified, to see that freight is properly loaded and stowed, and last, and perhaps most important, the systematic checking of stations, thus educating the station forces and eventually raising their efficiency. The department works in the field through traveling agents, four of whom are stationed at the four important junction points of the New Haven, i. e., Maybrook, N. Y., Westchester, N. Y., the New York piers and Boston, Mass. The remaining 14 representatives travel over the road. With such a force it is possible to put an experienced man on any situation in short order.

There is seldom any effort made to improve conditions until it becomes necessary through reasons of safety or expense. While it was realized that perhaps L. C. L. freight was not being handled in the best possible manner, no real campaign for improvement was instituted until the claim payments commenced to soar, being as follows for the years ending June 30:

		Pc.Cl	aim Payments
Year	Freight Revenue	Claim Payments	to Freight Revenue
1910	 \$30,116,588.30	\$334,565.85	1.11
1911	 : 30,329,092.32	349,100.88	1.15
1912	 32,130,891.56	346,931.78	1.08
1913	 34,071,974.75	589,595.72	1.73
		557,977.71	1.72
1915	 	452,238.47	****

Claim payments have decreased \$105,739.24 or 19 per cent as compared with 1914, on approximately the same amount of business.

The noticeable increases in 1913 and 1914 made some action imperative. The operating officers issued statements showing the seriousness of the situation and called on all employees to use greater care in the handling of freight. The freight claim agent furnished the Department of Station Service with a list of all patrons who had entered ten or more claims during the year. These were divided according to stations and commodities and the traveling agents interviewed these shippers. To date, several hundred of the principal firms have been visited and the spirit of co-operation shown is most encouraging. As a firm is interviewed, a report is forwarded to the Boston office.

Many valuable suggestions have been received and we feel that when we get the combined experience of 200 grocerymen, 134 furniture-men and 69 boot and shoe men (the numbers indicating the firms with over ten claims), we are going to know how to handle groceries, furniture and boots and shoes properly. Our representatives also pass along the suggestions they receive; to a manufacturer who is using fibreboard cases where wood is required, the weaknesses of the fibreboard is pointed out, and he is shown how dampness loosens the strips and makes pilfering a simple matter, how they are easily punctured, and how advertising the product on the case may invite theft. The possibilities of this work with the shippers have been touched on because we feel that it is the first step in improving the handling of L. C. L. freight.

Even if the large manufacturers do pack and mark their freight correctly, there will always be a large body of miscellaneous freight that is not properly prepared for safe transportation. The first opportunity to correct this is through the receiving clerks. This requires trained men. On the New Haven

meetings are held at intervals at the larger stations, where the more important features are discussed.

But no matter how complete the receiving clerks' knowledge, careful inspection is not possible on freight received at certain times of the day. For example, at the Boston freight terminal, approximately 65 per cent of the freight handled comes between 3 and 5:15 in the afternoon, and freight is often handled through the freight house into the car and on its way within a period of 20 minutes. Similar conditions prevail at Harlem River, Bridgeport, Providence, New Haven and other large stations. Thus, it is a difficult matter to keep the houses from becoming congested, let alone give freight the close inspection it requires. But assuming that through the efforts of the shippers and receiving clerks the freight is in the house properly packed and marked, the next thing to be considered is its safe carriage to destination, the secret of which is, first: clean cars in good condition; second: proper loading and stowing of the freight in the car, and, third: careful handling of the car in the train.

Before discussing proper stowing, I should like to call attention to the so-called rough handling now prevalent in those districts of the country where hump yards or electric power prevails. These systems do increase rough handling, especially in yards, and our investigations have indicated that more damage occurs in the terminal and transfer yards than on the road. We feel that the only logical conclusion is that the savings in operation are great enough to offset the additional rough handling, that this rough handling should be considered normal, consequently not rough handling, and that freight should be loaded and stowed in anticipation of it. This will require some additional labor and expense, but we believe that it will be proven that money spent in this way is money saved in the claim account, and in the better relations with the shipping public.

Proceeding on this assumption, loading and stowing resolves itself into closer supervision, and a reasonable expenditure in labor and money for bracing, the latter being the least important. Proper bracing is comparatively simple with L. C. L. cars that carry freight between large stations or transfers. Perhaps the bulkhead system, described recently in the Railway Age Gazette, is as good as as any yet proposed. By this method, L. C. L. freight is packed high and tight, the car being divided into compartments: tonnage is increased, a saving in car miles is effected, and the freight arrives with practically no damage. The chief difficulty has already been mentioned; the freight comes in with a rush in the late afternoon. Quick service and next morning delivery is demanded, which necessitates placing the freight in the car, breaking it down and closing the doors. The resulting hodge-podge is in no way due to a lack of knowledge as to proper loading or stowing. It is a question of time, not knowledge. Our freight houses cannot be closed any earlier in the afternoon without raising a storm of protest from the shippers. Neither can we hold up the cars for stowing and bracing, because nowhere is quicker service demanded than in New England, and cars must be gotten off soon after the houses are closed. Neither is it possible to hold freight for a certain car in the freight house until late in the afternoon and then load all the freight at once, because the facilities are crowded and the freight must be hustled into the car as it is received.

Accordingly, we feel that our best move is to have an expert stevedore in charge of a few cars, not over six and better fewer, who should see that this freight is loaded in the best possible manner and braced as necessary. Good stowing is simply the exercise of good judgment plus experience. Proper stowing may be checked by having the stevedore in charge sign a card which travels with the car, showing the originating station and requesting the destination point to report back any evidences of poor loading. A stub is retained at the originating point, the two are matched up and it is possible to see what stevedores are at fault, and then either make them improve or get out.

However, we feel the best check is to have surprise tests made by our traveling agents. The loading forces at every point on our line realize that an inspector may drop in on them at any time and they strive to load their cars properly. The traveling agents are not satisfied merely to watch loading for a little while, for, of course, it will be done properly when they are about, but they often visit a station after the cars are closed, have them reopened and if not properly stowed, worked over under their direction. During the week ending July 17, our 18 traveling agents made a special check of this feature, inspecting a large number of cars at different points, and the opinion is that cars are being well stowed. In fact, foremen at our transfer points state that the improvement within the past year and a half has been very great, for which we are inclined to credit closer supervision.

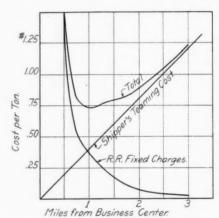
THE LOCATION OF THE FREIGHT HOUSE

By D. A. Tomlinson

Assistant Engineer, Chicago & Western Indiana, Chicago, Ill.

To give value to any raw material two distinct operations must be performed on it. Its form must be changed so that it is ready for use, and it must be moved to a location where it is needed. Factories and industries of various kinds perform the first service, railroads and other transportation agencies the second.

A railroad's freight traffic naturally divides itself into two general classes, carload and less-than-car-load or package freight. In handling carload freight the railroad handles the car as a unit, and does not handle the freight itself. The shipper loads the freight and the railroad collects the cars, assembles them into trains and delivers them to the consignee, who unloads them. But in the second case (package freight) the railroad handles not only the car but also the freight, for it is



Land values taken from Olcott's"Land Values in Chicago".-Fixed charges on land, 5% per annum.-Capacity of L.C.L. facilities, I ton per sq. ft. per annum. Cost of teams \$0.60 per hour.-Av. load of teams, I ton (I way light.)-Av. speed of teams, 3 miles per hour.-Loading and unloading time of teams and haul if freight houses were at business center, omitted.

small in volume, and many shipments which are to travel over the same route must be assembled into one car.

In small cities there are usually but one or two railroads, distances are relatively short, teaming costs are small, there is but little competition between railroads, and the L. C. L. traffic is relatively unimportant. Each road maintains a freight house adjacent to its tracks near the business part of the city where it receives and delivers its local package freight. In large cities, however, the proportionate volume and importance of L. C. L. freight is far greater; the distances that freight must be hauled by team are longer, and there is active competition between railroads. In a general way the L. C. L. traffic of a city may be divided into two parts: First, and more important, that of the business district; second, that of the outlying manufacturing districts. Usually the wholesale houses and light manufacturing plants-the largest users of the package freight service-are grouped on the edge of the business district, the L. C. L. tonnage per square mile, being very high. This district is served by the downtown railroad freight terminals, the average team haul

is moderate, and any shipper located there can reach any rail-road readily.

In considering the center of the city and the methods and costs of handling L. C. L. freight there, a central location is obviously necessary for firms engaged in certain lines of business. It is equally obvious that these firms require convenient and accessible freight facilities. For the best interests of the community as a whole it is desirable that the total costs of freight service be a minimum, because all costs are borne by the ultimate consumer in the final analysis. These terminal costs of handling L. C. L. freight may be summarized as shown in the following table:

COSTS TO THE RAILROAD PER TON	
Minimum	Maximum
Fixed charges on land. \$0.25 House labor cost. 0.30 Clerical cost 0.10 Switching cost 0.10 Use of cars 0.05	\$1.00 0.70 0.20 0.20 0.15
Total\$0.80	\$2.25
COSTS TO THE SHIPPER PER TON	
Minimum	Maximum
Labor cost at his place of business\$0.20 Hauling cost	\$0.40 2.00
Total\$0.70	\$2,40

These represent merely the total cost per ton to the railroad and shipper at the terminal. The costs of road haul are not included. The shipper's loading cost depends on the character of his business and the efficiency of his management. The railroad's house, clerical, switching and car costs, depend on the design of its facilities, the character of the freight and the efficiency of the organization. These items of cost borne by the shippers have no bearing on the costs borne by the railroads, and vice versa. The other two items, the shipper's hauling cost and the railroad's fixed charges, are mutually dependent; the further downtown the railroad freight houses are located, the higher are the railroad's fixed charges, and the lower are the shipper's hauling costs, and vice versa. Also if the freight terminals are too near the center of the city they may congest the business district and restrict its growth. The most economical locations for the railroads would be two or three miles out. where ground values are only a small percentage of those close in, but if such locations were adopted the shipper's hauling cost would become prohibitive and business would seek other cities. The ideal condition would seem to be the location of the freight teminals at such a distance out that the total of the average teaming cost and fixed charges would be a minimum. This is difficult to determine, because little is known in regard to the amount of freight derived from each block, the "freight center of gravity" of the district to be served, or of the other factors that must be considered.

In any particular city these can be determined approximately by careful study, and a valuable analysis can be developed, although the writer knows of only one or two instances where it has been done. The chart shows this for Chicago. The "freight center of gravity" is assumed to be at Madison and State streets, practically at the center of the business district, as that simplifies the calculations, although the actual center is probably a few hundred feet further west. Observations of teams and shipments have shown that the freight terminals serve a district about four miles in diameter, the L. C. L. freight density being greatest about 1/2 mile from the center, and diminishing rapidly from there out. If the freight were hauled to the center of this district the average haul would be about 34 mile, and the hauling cost about \$0.90 per ton, assuming the average wagon's load at one ton, its cost \$0.60 per hour, loading and unloading time one hour per trip and its average speed three miles per hour. Each mile that the freight terminals are moved away from the center adds a mile to the team haul, and \$0.40 per ton to the teaming costs.

The variable railroad cost (fixed charges on land) varies inversely with the distance out, decreasing from \$10 a ton at the center of the city to about \$0.38 one mile out, and \$0.07 two

miles out. The total cost decreases rapidly, reaches a minimum about a mile out, and then gradually increases. It would seem as if the best results for the community as a whole would be obtained if the freight houses were located from 34 mile to 11/2 miles from the center. The majority of the present freight houses are now located in this area, not because it was found to be the economic location, but because the expense prevented a location closer in, and competition forbade a location further out. Then conflicting demands of railroads and shippers, the former desiring a moderate investment in terminals and the latter desiring railroad facilities adjacent to their places of business, seem to have counterbalanced each other, to the best interests of the community as a whole. Some suggested terminal rearrangements contemplate the relocation of the freight terminals a mile or more farther out than at present, claiming that to be required by the best interests of the city. The cost of the added team haul is a serious objection to such plans, which has apparently not been considered by their advocates. These principles, brought out in Chicago, will probably also be found correct in most other large cities.

STARTING AT THE BEGINNING

By H. S. James St. Paul, Minn.

Co-operation between shippers and carriers is necessary in the handling of L. C. L. freight. Constant improvement is being made in preparing such freight for transportation. It is, as a rule, being marked so fully that it will continue to destination, "On the marks," if it becomes separated from its waybill. Correct weights are being furnished by the carriers to a great extent than formerly, for which past crusades deserve credit. However, many consignors are still remiss in the following particulars:

1. Their shipping orders are often illegible.

- 2. They use printed forms, narrowly spaced, for bills of lading and shipping orders with carbon sheets between, which often slip, causing wrong items to be listed on the shipping orders.
- 3. They do not group the items on the shipping orders according to their classification, for the convenience of the carrier in rating and waybilling. There is a great chance for reform here.
- 4. They do not always tally the freight from their platforms to their drays, nor do they invariably furnish their draymen with shipping orders (for the carrier) for the entire shipments comprising each drayload.
- 5. They allow their draymen to hold drayloads of freight over night in barns, which practice should not be tolerated for obvious reasons.
- 6. They trust too much to their shipping departments. At a certain freight station 2,000 errors, all made by the shipping department of one large concern, were discovered and corrected in a single year, the shipping orders calling either for more or less or for different articles than were delivered to the carrier. When its attention was called to this record, the concern at once reorganized its shipping department. At that freight station an error book was kept in which all errors made by local shippers were recorded, hence the freight agent was prepared to co-operate with the shipper and help to bring about a needed reform.
- 7. They hold back their shipments until late in the day. They deliver them at the freight house when the closing rush is on and the cars for the various districts are almost full. This works great injustice to the consignee and is a positive hardship to the carrier. Here is an inviting field for local commercial clubs to do some missionary work.
- 8. They do not always cause their shipments to be protected during inclement weather while they are being hauled to the freight station, yet they often object if the carrier stamps on their bills of lading—"Received in the rain."

All of which goes to show that any general movement for the

betterment of conditions in the handling of L. C. L. freight should start where the shipments originate.

Large freight stations for the forwarding of L. C. L. freight should have a simple and effective system for receiving, checking, trucking, weighing, stowing and bracing such freight, the simpler the better for new men must be educated quickly. The first and most necessary essential is to have a proper loading plan. That part of the road which is served from an important freight station is, for the station's purposes, usually divided into loading districts. Experience and observation show how such districts should be arranged, average daily tonnage and the avoidance of extra haul being considered.

Portable runways must be provided to bridge between the doorways of opposite cars. Those made of plate iron, with the ends slightly bent downward and sharpened, to prevent slipping, give good service. A convenient way for lighting the cars is necessary for which electric bulbs, with wire guards, or hoods, are handy and safe. There must be plenty of good trucks, to save extra handling and to expedite the work. Few freight stations have enough trucks. It is desirable that all trucks used should be of the same tare weight, as far as practicable so that the scales may be balanced to offset their weight. A generous supply of portable dashboards, for trucks, should be kept on hand so that full loads of light, bulky articles may be placed on trucks. At some freight houses a permanent dashboard, in the shape of a folding iron frame, is attached to each two wheeled truck, a very convenient arrangement.

The floors of freight houses should be smooth for ease and safety in trucking for rough floors cause much damage to freight. Many freight houses have not enough scales, while those furnished are very often not conveniently located, although this seems strange, considering that scales are, in effect, the yard-sticks of the carriers' business.

Upon the local freight agent of a large freight station usually devolves the important task of adopting some one of the many schemes in vogue, for handling his L. C. L. freight from the shippers' wagons, through his freight house, to the cars placed for district loading. This is easy in theory, but complex in practice, because of the variable human element necessarily involved. Fortunate, indeed, is the agent who "passes up" all fussy, elaborate handling schemes and adopts some simple, easily understood plan that is direct and effective.

The great question now confronting the carriers relates to astray freight. The rule requires that: "Astray freight at destination will be delivered only on presentation of original bill of lading or other proof of ownership." And yet such freight is continually being delivered otherwise for various reasons. Consignees need a missionary among them to educate, encourage, induce and, in some cases to force them to show more interest in the carriers' side of this rather exasperating, but, by no means, unsolvable problem.

The time is ripe for the compilation, publication and general distribution, in the railway world, of a standard code of freight traffic rules and regulations, which should be similar in scope to the standard code which now governs the operating department. It should be, in effect, a text book for the guidance of the veteran as well as for the education of the understudy.

ELECTRIC RAILWAY IN ROME.—An electric line is being built by an Italian company in the neighborhood of Rome. The railway will join the Italian capital with the famous mineral springs of Fiuggi, and will be extended later on to other towns of the province, such as Alatri, Guarcino, etc. The work is almost completed, and it is expected that the line will be opened to traffic as far as Fiuggi shortly. The work of the new railway line to Naples is progressing, but somewhat slowly, and it is to be foreseen that the line will not be opened for business until the latter part of the year 1916, though the most difficult part of the work from an engineering point of view seems to have been completed some time ago.

THE LIFE OF A STEEL FREIGHT CAR*

By Samuel Lynn

Master Car Builder, Pittsburgh & Lake Erie, Pittsburgh, Pa.

In preparing this paper it was decided to get the opinions of some other car men regarding the life of a steel car and I wrote to several friends who have had considerable experience with such cars. Their replies showed that there is quite a diversity of opinion and that a steel car will last anywhere from eight to fifty years.

Years ago while working on the shop tracks repairing the old wooden cars, I can remember distinctly seeing an occasional train of steel cars, or "battleships" as we called them, go by; the repairmen would get together and discuss the question of where they would get their bread and butter when the old wood car finally went to the scrap pile. There are some car department officers at even this late day who apparently feel that the steel car does not require much attention. However, this theory is no longer given much consideration, as any one responsible for steel car maintenance realizes that while the steel car, with its larger carrying capacity, increases the earnings of a road, after the car reaches a certain age its maintenance cost increases over that of the old wooden car. As a consequence there are several things that must be considered when discussing this subject.

First.—It seems to me that the problem of most importance is the design of the car. Care must be taken to get the required strength in the underframe in order that the car may withstand the shocks incident to present-day transportation. In addition to a good solid underframe, the draft sills and draft gear must be equally strong to stand up to their work. I have seen new cars turned out of a car plant and after the first or second loading the draft sills, or center sills extending from the end sill to the front of the body bolster, were so badly buckled that they had to be removed and replaced and reinforcement added to strengthen the weak members; and these cars, although practically new, were useless until the parts mentioned had been reinforced to take care of either oversight or poor judgment in the drafting room. Consequently, too much stress cannot be laid on proper design.

Second.—The commodities with which a car is loaded and the climatic conditions in the territory through which it travels are important factors in the life of a steel car. The cars in this territory used exclusively in the coal, coke and ore trade are subject to very severe service, as they are usually hauled in heavy tonnage trains, and the acids in the coal and coke eat through the floor sheets rapidly. In addition to the injurious effects of the acids on the inside of the car, the varying weather conditions—rain, snow and heavy damp atmosphere—play important parts in the deterioration of the car.

As previously stated, at one time a number of car department officers were of the opinion that the steel car required but little attention, and as a result in its early existence even the car inspectors would look over the car primarily for safety appliance defects, hot boxes, etc., and take it for granted that because the car was of steel construction it was all right. For some reason, the steel car from the time it first went into service did not seem to have a friend. At the industrial plants where the cars were unloaded the men took frequent cracks at them with sledges and as a result the side and hopper sheets soon became bent and distorted. During the winter season when ore became frozen in the cars, some of the plants used dynamite to loosen it up and in addition they frequently loosened up the floor and side sheets at the rivets. If the steel car was given reasonable treatment and repairs made when needed, and repainted when the steel became exposed to the weather, the renewing of some of the parts would not become necessary for a longer period than is now the case.

The original painting of the steel car is usually faulty. Owing

^{*} From a paper presented at the December meeting of the Railway Club of Pittsburgh.

to the hurry up methods of the building the required quality of paint is liable to be dryer-sacrificed, or made to fit the building time of the car, without giving the protective qualities of the paint due consideration. I do not want to be understood as saying that paint will cure all the ills of the steel car, but do believe that if a liberal quantity of good paint was used to protect all outside exposed parts, the life of the car would be lengthened considerably. Occasionally we may hear some railway officer use the expression that "a steel car will run and earn just as much money without paint." This may be true, but the question is, how long will it run? I firmly believe that part of the expense necessary on steel equipment today is due to paint neglect. I do not favor painting the inside parts of any steel car-the first loading would cut and mar the paint so that moisture would get under it-but by keeping the outside exposed parts painted, the corrosion of the outside parts of the sheets would be counteracted to a considerable extent.

On hopper cars it has been found that after the first 10 or 12 years' service the floor and hopper sheets deteriorate from 1/4 in. in thickness to a very light gage. In fact, along the seams and sides of the cars where the floor sheets are riveted to the sides, in some cases the steel is completely eaten or rusted through, and in order to get any further service from the car it is necessary to renew the floors and hoppers. This has been done on a large number of steel hopper cars at an approximate cost of \$225 a car. After this class of repairs is completed and the cars have been in service for about four years we find that the car sides which were in fairly good condition when the new floors were applied have deteriorated to such an extent that it is necessary to renew the sides of the cars. This work can be done at an approximate cost of \$130 a car, making a total expense of \$355 a car on the car body, exclusive of various light repairs necessary at different times.

While this class of repairs are being made it is found in a few cases that the center sills have deteriorated to some extent from corrosion. They may also have buckled, making the application of new sills necessary. Where new sills are applied on such cars there is an additional cost of \$45, making the total amount spent on the car body approximately \$400. However, on a very large percentage of the cars on which this class of repairs is being made we do not find it necessary to renew the center sills. These sills, in most cases, have been reinforced between the body bolsters and the hopper sheets by a tie plate or channel section riveted to the sills, the cost of this application being included in the estimates already given.

From the above it would seem that the bodies of the majority of the first steel cars built, or cars that have been in service 16 or 17 years, will require repairs amounting practically to the rebuilding of the car body. This rebuilding process, however, occurs at different periods, whereas if all the parts of any unit of equipment deteriorated at the same rate, there would be no question but that the average depreciation could be fixed very closely, as every part of the unit would become worn out at the same time and the whole body of the car would therefore probably be scrapped or rebuilt as a new unit. The present policy of maintaining the steel car as different parts fail is practically the same method as was employed in the maintenance of the wooden car equipment.

It has been the custom of car department officers to estimate the life of the wooden car of either the box or gondola type at 20 years. The old wooden car, during the 20 year period, received at different times repairs such as two or more longitudinal sills, the renewal of the top side plate, new floors, and other repairs which amounted practically to the rebuilding of the car, yet for general purposes 20 years was considered the average life of the wooden car.

Allowing the same treatment for a steel car, that is, giving it general repairs when necessary and properly maintaining the car so as to get maximum service from it, the steel car is still in serviceable condition after it has run 16 or 17 years.

Some mechanical department officers take the position that it is more economical to prolong the life of the car by repairs.

while others say it is better, from an economical standpoint, to run the car until it requires repairs such as have already been described as necessary for the car after it has been in service about 12 years, and then scrap the body and place a new body on the trucks. They take the position that when the floors and hoppers are worn out, the balance of the car has deteriorated to such an extent that it is cheaper to scrap the body than to try to maintain it.

The first metal car purchased by the Pittsburgh & Lake Erie has been in continuous service since June, 1897, except for short periods when it was in the shop for class repairs, and is therefore over 18 years old. It is an 80,000-lb. capacity car of the hopper type; has a cubical capacity of 1,286 cubic feet; weight new 35,700 lb.; weight last time weighed in June of this year, 35,200 lb. The car was built of wrought iron by the Youngstown Bridge Company and is in good condition today. The original sills, bolsters, end sills and draft members, as well as the sides, are still on the car. It received heavy repairs in the years 1912 and 1915 at an approximate total cost of \$450. After a close inspection of the photograph I do not believe there is any one present who will say that the appearance of this car indicates that it should go to the scrap pile.

F. W. Dickinson, master car builder of the Bessemer and Lake Erie, advises that their first steel cars, over 19 years old, are in almost as good condition as when first built. The Bessemer and Lake Erie is one of the pioneers in the use of steel cars, yet Mr. Dickinson advises it is practically impossible for him to make any definite statement as to the probable life of a steel car.

There is one other reason why we should refrain from placing a limit on the life of the steel car, and that is, the steel that is now being purchased and used for repair parts is inferior to the steel that went into the first cars built. While I am not a steel man and know nothing about the business, the fact remains that the steel plates that are being purchased and used for repairs are deteriorating much faster than the original sheets placed on the cars. Whether this is due to the composition of the metal, or to some other cause, I do not know. If this same grade of steel is being used by car builders today on new equipment, and an estimated average life was placed on cars based on the lasting qualities of the material used when steel cars were first built, the steel in the cars that are being built and turned into service today might not last more than one-half the time of the steel in the cars first built, and it is therefore my opinion that we would be doing the steel car an injustice to say that at the end of any stated period it should be relegated to the scrap pile. I believe that the steel car can be maintained as long as the owner desires to run that particular type of car.

Russian Freights Reduced.—Reports from Petrograd state that railway freight rates for the carriage of grain, oats excepted, between Russia and China, are to be reduced on and after December 25. This applies only to through carriage from the districts of Cheliabinsk, Novo-Nikolaievsk, Tiumen and Kulomzino, on the Omsk Railway system, and from the stations on the Tomsk Railway system, across Manchuria and Pogranitchnaia to Vladivostock, for export abroad. The reduction of rates is conditional on the production of customs' certificates guaranteeing that the goods specified are bona fide for export.

Australia's Strategic Railway.—The proposal to construct a long line of railway from a point in South Australia through a portion of New South Wales and on to Queensland, chiefly for strategic and developmental purposes, has been dealt with by a conference of premiers of the Australian states. It has been decided that a conference between the military advisers of the commonwealth and the railway commissioners of the states should be held. This conference is expected to take place shortly. The proposed strategic line will be in addition to both the east to west and the north to south transcontinental railways.—Engineering, London.

GRENVILLE M. DODGE

Major General Grenville M. Dodge died at his home in Council Bluffs, Iowa, on January 3. General Dodge selected the route for the Union Pacific and was chief engineer during its construction. He was a graduate of West Point and a corps commander in the civil war. He laid emphasis in his writings and in his addresses on the fact that "private enterprise made the explorations, determined the line and built the Union Pacific Railway." It was General Dodge himself who selected the route of the Union Pacific and it was in good part due to the confidence which eastern bankers, and especially Philadelphia bankers, had in his judgment and ability that private enterprise was induced to persevere in the face of the discouragements which

came up in the course of construction. General Dodge never was an operating man, but when E. H. Harriman became president of the reorganized Union Pacific and took his operating and engineering officers over the road it was agreed that the route selected for the Union Pacific was the best possible route in that latitude.

General Dodge was of the pioneer generation in American railroad building. He was born in 1831, and in methods and thought was of an earlier generation than James J. Hill. Of the school of Grant and Sherman he was terse, unbending, commanding strict obedience to authority, and when in subordinate positions he carried out the orders of his superiors with military precision.

On the joining of the Central Pacific and the Union Pacific, which completed the transcontinental line, General Sherman, under date of May 11, 1869, sent the following telegram to General Dodge: "In common with millions, I sat yesterday and heard the mystic taps of the telegraph battery announce the nailing of the last spike in the great Pacific road. Indeed, am I its friend? Yea. Yet, am I to be a part of it, for as early as

1854 I was vice-president of the effort begun in San Francisco under the contract of Robinson, Seymour & Co. As soon as General Thomas makes certain preliminary inspections in his new command on the Pacific, I will go out, and, I need not say, will have different facilities from that of 1846, when the only way to California was by sail around Cape Horn, taking our ships 196 days. All honor to you, to Durant, to Jack and Dan Casement, to Reed, and to the thousands of brave fellows who have wrought out this glorious problem, spite of changes, storms, and even doubts of the incredulous, and all the obstacles you have now happily surmounted."

Grenville M. Dodge was born April 12, 1831, at Danvers, Mass. In April, 1853, Dodge became rodman for Peter A. Day, who was division engineer of the Rock Island and later chief engineer of the Mississippi & Missouri Railroad. In 1853 he was placed in charge of the field party to make the survey for the first line across Iowa. From then on to 1857 he collected all the information that he could as to the best route for a railroad to

the Pacific, reporting to Henry Farnum and Thomas C. Durant. In 1857-58 he was invited to go to New York and report to the directors of the Mississippi & Missouri Railway in the office of the Rock Island over the Corn Exchange Bank in William street. As he tells the story himself, "The secretary of the company read my report. Before he was half through nearly every person had left the room and when he had finished only Mr. Farnum, Mr. Durant, the reader and myself were present."

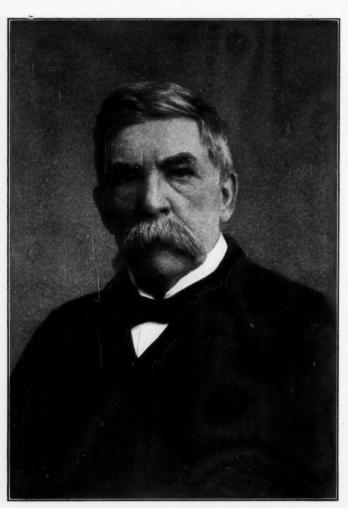
Farnum and Durant commissioned Dodge to try to get local aid to build east from Council Bluffs through Pottawattomic county. Explorations were continued up to 1861 when Dodge returned to his post in the army. In his little booklet "How We Built the Union Pacific Railway," published some few years ago, General Dodge says: "The passage of the bill of 1862, which

made the building of a transcontinental railroad · possible, was due primarily to the persistent efforts of Samuel R. Curtis, representative in Congress from Iowa, who reported the bill before entering the Union service in 1861. It was then taken up by James Harlan, of Iowa, who succeeded in obtaining its passage in March, 1862. Ground was kroken in Omaha in 1863, and in 1864 General Dodge had an interview with President Lincoln in which he obtained the promise of government support and took this promise to New York to T. C. Durant, then at the head of the Union Pacific interests. Following General Dodge's report the company was reorganized. General John A. Dix was made president; T. C. Durant, vice-president; H. V. Poor, secretary, and J. J. Cisco, treasurer.

General Dodge was given leave of absence by General Sherman to become chief engineer under date of May 1, 1866. In 1869 the Union Pacific was completed to a connection with the Central Pacific. General Dodge was a director of the Union Pacific from 1868 to 1897. He was chief engineer of the California & Texas Railway Construction Company in 1872 and 1873, and was chief engineer of the Texas & Pa-

engineer of the Texas & Pacific Railway from 1873 to 1880. He was president of the Missouri, Kansas & Texas from July to December, 1880, and then was made president of the Pacific Railway Improvement Company, which built the road from Ft. Worth, Tex., to El Paso. He was also president of the American Railway Improvement Company, which built the New Orleans Pacific, and the International Railway Improvement Company, which built extensions of the Missouri, Kansas & Texas, and the International & Great Northern. He was also in charge of the engineers who surveyed and partly built the Oriental Railway from Laredo, Tex., to the City of Mexico, later the Mexican Central. In 1893 he was made president of the Ft. Worth & Denver City, now a part of the Colorado & Southern. In 1898 he became chairman of the board of the Colorado & Southern, which took over the Ft. Worth & Denver City.

Female Labor on Bavarian Railways.—The Bavarian State railways will employ women during the war for all the lighter kinds of work.



General Grenville M. Dodge

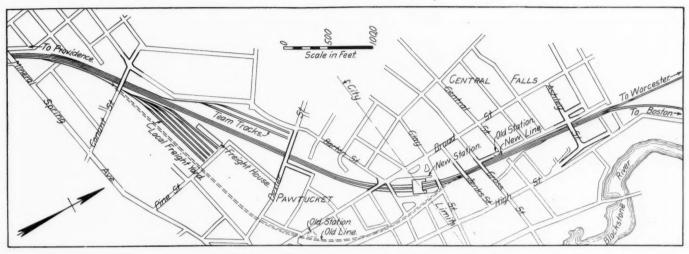
Improvements at Pawtucket and Central Falls

The New Haven is Completing a New Four-Track Line and Station and Eliminating All Grade Crossings

The New York, New Haven & Hartford is completing extensive improvements in Pawtucket and Central Falls, R. I., involving an expenditure of approximately \$2,500,000. This work includes the construction of a new four-track line through the two cities, the separation of all grade crossings with streets within the limits of the work, the building of a new passenger

with only a short distance of three and four-track road at the west end. It crossed most of the principal streets at grade. Separate stations less than half a mile apart were maintained in Pawtucket and Central Falls.

The demand for additional facilities and the improvement of existing conditions becoming urgent, the state legislature of

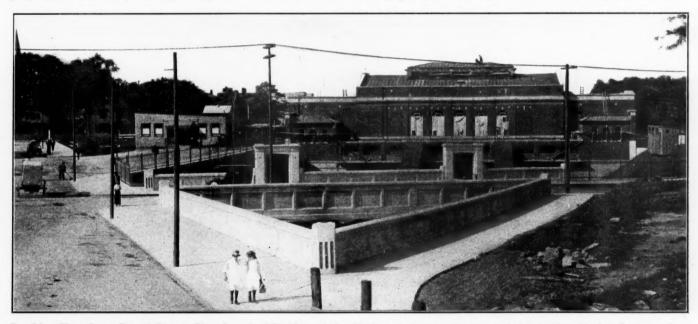


Realine ment Through Pawtucket and Central Falls

station for the joint use of the two communities and the construction of a new bulk delivery freight yard on the north side of the main line in Pawtucket.

Pawtucket and Central Falls are cities of approximately 60,000 and 25,000 population, respectively, and for all but corporate purposes are essentially one city. They are located on the main

Rhode Island passed an act directing the governor to appoint a commission consisting of one representative for each of the cities and one for the railroad to study the problem, to determine the nature and extent of the improvements to be made and to assume charge of their construction. All plans have been prepared and work conducted under the supervision of this



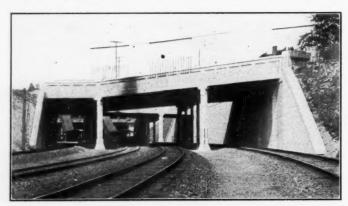
Looking East from Broad Street, Showing the Masking of the Girders at Barton Street, and the Station Under Construction

New York-Boston line of the New Haven, five miles north of Providence. Central Falls is also the junction point for a two-track branch line from Worcester, Mass. About 125 freight and passenger trains each way pass over the main line daily. The old line was double track road through these two cities

commission. It was also provided by this legislation that each city should pay 35 per cent of the actual cost of eliminating grade crossings with the tracks then existing and that the railroad should pay the remaining 65 per cent of this cost and should also pay all additional cost resulting from increasing the

number of tracks over and above the number previously existing.

In studying this problem the commission found that the additional facilities necessary could only be provided on the old line at heavy expense and that the separation of grades with the streets would require the construction of expensive bridges and the payment of heavy property damage. It was finally decided therefore to build a new four-track line about one mile long on a new location connecting with the old line near the old Central Falls station and to lower the grade and rebuild the line for four tracks from this point east to Boston Switch. As a part of this project it was decided to carry all streets over the tracks and to construct a station on the corporate line be-



Looking North at Broad and Barton Street Bridges

tween the two cities to replace the two existing stations. This new line eliminates 68 deg. of curvature and one reverse curve, 600 ft. of distance and five grade crossings. It also gives the New Haven a four-track line through both cities in addition to improving its local freight yard facilities.

To secure the separation of grades with the streets, it was necessary to depress the new line for the entire distance as well as to lower the old line east of the junction. This required the excavation of about 400,000 cu. yd. of material, consisting of sand, gravel and boulders badly mixed. Many of the boulders had to be broken before loading, while two ridges of rocks were encountered in the bottom of the cut, requiring the removal of about 30,000 cu. yd. of this material. The new



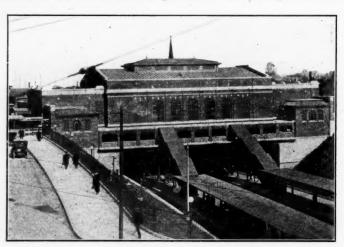
Looking North Over Clay, Jenks, Cross, Central and Ashley Street Bridges

line was built through a well-settled part of the city and it was impossible to secure all the property necessary as promptly as desired. It was also necessary to lower many sewers and water mains before excavation could proceed, while in a number of cases sewers were rerouted and combined into one trunk sewer. These conditions greatly handicapped the prosecution of the excavation work and prevented the shovels from working

continuously from one end of the cut to the other. This condition was further complicated by the necessity of keeping two streets open at all times in Central Falls and the same number in Pawtucket.

Two 70-ton Bucyrus steam shovels operated by company forces loaded the material into Rodger ballast cars. About 125,000 cu. yd. of this material was hauled eight miles to Olneyville, in the western part of the city of Providence, where it was used for track elevation purposes on the Pascoag branch. A considerable amount of dirt was also used to fill the old roadbed from Broad street to the site of the new station, making a 60-ft. boulevard from the center of Pawtucket to the south approach to the new station. At the same time the city widened Broad street to 60 ft. from the old station to the new site to give a similar approach to the north side of the station. At the same time Broad street, from Mills street to Clay street, adjoining the north approach to the new station, was widened to 70 ft. by the commission to prepare for the increased travel to and from the station and the installation of the necessary trolley tracks. The remainder of the material excavated from the cut was unloaded about two miles west of the work at the site of a proposed engine terminal.

While the work on the new line could be prosecuted independent of traffic, it was necessary to move the tracks on the old location north of Clay street to one side before the roadbed could be lowered to the new grade line. To accomplish this a



The Station Nearing Completion

temporary double track line was built from the junction of the old and new line east of and parallel to the old line to connections with the Boston and Worcester lines beyond the limits of the grade reduction, and traffic was diverted over this temporary line The old tracks were then taken up and the grade lowered to its new level. In changing the Boston line over to its permanent location it was necessary for it to cross the temporary Worcester line below the original grade on the latter. This required the excavation of about 800 cu. yd. of material and the laying of the connection with the minimum interference with traffic. To accomplish this, two steam shovels were started at 1 a. m., after the passing of most of the night trains, and worked toward each other, casting the dirt to one side. Gangs followed closely behind each shovel, laying track, and completed the connection at 6 a. m., trains in the meantime having been detoured over another line. In this interval of five hours the excavation was completed and 10 tracks were cut and connected up.

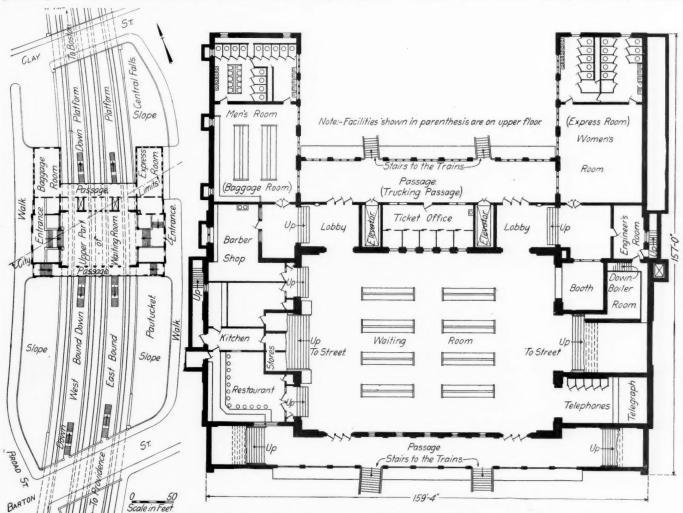
The separation of the grades with the street required the construction of eight highway and one foot bridges, Pine street being closed on the new line. A minimum clearance of 18 ft. above the top of the rail was maintained at all of these structures. With the exception of the bridges at Broad and Barton streets, just south of the station, these structures consist of unprotected plate girder spans on the curb lines with canti-

lever supports for the sidewalks. Those at Broad and Barton streets are built with girders incased in concrete in harmony with the station and located on the outside sidewalk lines. All these bridges are provided with reinforced concrete floors and asphalt pavements.

Special attention was given to the construction of the retaining walls, a considerable amount of which were built on curves parallel to the outside tracks, in this way materially improving the appearance of the walls. To do this forms were built extending 22 in. below the top of the foundation and providing for the construction of 6 in. of neat work with the

granite is used for a base course 6 ft. high. The building is protected from the action of locomotive gases below by the construction of a suspended concrete ceiling and smoke guard, leaving exposed only the lower flanges of the girders carrying the building. The areas beneath the floor and between the girders are utilized for pipe galleries.

The main waiting room is located in the center of the building 8 ft. below the level of the streets on either side. It is reached from entrances on either side by marble stairways 20 ft. wide. The waiting room is 96 ft. long by 64 ft. 8 in. wide and 30 ft. high. It is finished with "Welsh" quarry tile floor, Botticino



Track Layout at Pawtucket-Central Falls Station on the left; Floor Plan of Main Floor on Right

footing course. The outer face of this neat work was lined accurately parallel to and 10 ft. from the center of the adjacent track. After this course had set, the forms for the upper portions of the walls were erected in 15-ft. sections, lined with this neat work, and the remainder of the concrete placed. These forms were stripped as quickly as possible and the surface rubbed with a wooden float and water while green, removing all form stains and giving a clean, uniform appearance to the wall.

The Passenger Station

The passenger station is located directly over the tracks on the line dividing Pawtucket and Central Falls. It is U-shaped with a length of 159 ft. 4 in. at right angles to the tracks and a maximum width of 140 ft. 8 in., exclusive of a 16-ft. covered passageway extending across the entire front of the building on the west side. The building is of fireproof construction throughout. The foundations to the level of the main floor are of concrete, while the exterior walls are of rough wire cut tapestry brick laid in Dutch "bond" with raked ½-in. joints. The trimming and cornice are of concrete, while Stony Creek

marble wainscot 8 ft. 8 in. high and walls of Caen stone plaster. The central portion of the ceiling consists of an ornamental leaded light of approximately 1,000 sq. ft. area and the remainder of the ceiling is a barrel velut, highly ornamented.

A ticket office with five windows is located along the east side of the waiting room, while telephone and telegraph booths restaurant, barber shop, news-stand and similar facilities are grouped about the waiting room. Baggage and express facilities are located in the two wings of the building on the street level, entirely separated from other passenger facilities, including driveways. The men's and women's toilets and smoking and rest rooms are located in the wings directly below the baggage and express facilities.

Two electric elevators are provided, one on each side of the ticket office, to transport express and baggage between the receiving rooms and the platforms. A trucking passage on the level of the express and baggage facilities extends across the east end of the building, the elevators opening directly onto this passage. A similar passageway directly below this express runway on the level of the waiting room floor, provides

access to the elevators for passengers. Two stairways also lead from this latter passageway to the train platforms below.

Another passageway extends across the entire west end of the building, leading directly to the street at either end and



Track Layout at Boston Switch

opening at one side into the waiting room and on the other to stairways leading to the train platforms. Passengers may therefore go directly from either street or from the waiting room to trains. Additional access to the platforms is provided The lighting throughout the building is by means of ornamental chain fixtures of bronze finish. A low-pressure steam heating system has also been installed with radiators concealed in the seats and behind bronze grilles in the walls.

Butterfly sheds are provided on the platforms. These sheds are of steel construction with the bases of the vertical posts incased in concrete and with the tops of ferroinclave covered with hair plaster below and a sand and cement mortar on top carrying a prepared red roofing slate. The platforms are about 800 ft. long and have a maximum width of 20 ft., the construction being of concrete with a granolithic wearing surface.

The areas in front of the station at each approach have been laid out in flower beds and grass plots with Tarvia driveways, concrete walks, etc., setting off the station in an attractive manner. Similarly, the earth slopes of the cut in the vicinity of the station have been planted with crimson rambler and climbing roses to add to the attractiveness of the surroundings at the level of the train.

New all-electric interlocking towers have been built at the east and west ends of the work. The tower at the west end governs main line movements and also those between the north and south yards at Pawtucket, while that at the north end is located at the junction of the Boston and Worcester lines. A photograph of one of the standard brick towers with concrete roof is shown. No. 20 turnouts have been installed for all high-speed passenger movements; No. 15 crossovers for main line freight movements and No. 10 crossovers for all backup movements. One movable point crossing was installed at Boston Switch, crossovers being used elsewhere in accordance with the general practice of the New Haven to avoid movable point crossings wherever possible.

The tracks have been laid with 100-lb. rail on untreated oak



Looking East from Conant Street; New Team Track Yard on the Left and the Old Yard and Freight House on the Right

by two covered stairways leading from the Barton street bridge. The floors of these passageways and the stair steps are finished by sifting ground carborundum in the last half inch of concrete and then sprinkling on the surface and troweling it in, giving a non-slipping surface. The standard Master Builders' surface is used on other floors where heavy trucking is done.

and chestnut ties with cut spikes and rock ballast. Manganese frogs and Manard reinforced switch points have been installed in all main line turnouts. A 5-ft. steel picket fence, with the posts set in concrete, has been built throughout this improvement as the right-of-way fence.

This work has been handled under the direction of Edwin Gagel, chief engineer; I. D. Waterman, construction engineer,

and A. L. Curtis, assistant engineer of the New Haven. The station was designed and built under the direction of F. W. Mellor, architect of the New Haven. C. W. Blakeslee & Sons, New Haven, were general contractors for all masonry work and all street changes, including paving, alterations in sewers and grading of street approaches. Practically all steam shovel and track work was handled by company forces. The American Bridge Company, New York, erected the Conant and Dexter street bridges, while all other steel bridges were erected by the Boston Bridge Works. The steel for the station was furnished and erected by Levering & Garrigues, New York, while the station proper was built by Norcross Brothers Company, Worcester, Mass.

NEW ALTERNATING CURRENT SIGNAL INSTAL-LATION ON THE GRAND TRUNK

The marked advantages of alternating current power for the operation of automatic signals under certain conditions, even when a line is not electrified, are well illustrated in the installation on the Grand Trunk between Chicago & Western Indiana Junction and Thornton Junction, recently placed in service. This 19-mile section lying partly within the city limits of Chi-

a heavy eastbound refrigerator car traffic for years, and it was on the eastbound track that most of the trouble was experienced. The thoroughness of the brine impregnation is shown by the fact that the ballast in drying out after a shower is almost white with the salt crystallized on the surface. This trouble is, of course, aggravated by the fact that much of the ballast is kept constantly moist through capillary attraction from the ground water below.

While the resistance of this ballast when dry is about normal —5 to 6 ohms per 1,000 ft.—during very wet summer weather this resistance amounts to only about 0.3 ohm per 1,000 ft. This change in ballast resistance takes place rapidly during warm summer rains, 10 minutes often being sufficient for it to drop to 0.6 ohm per 1,000 ft. The temperature has a very marked effect on this action. A cold rain will not reduce the ballast resistance to anywhere near the point that the same amount of precipitation will if the temperature is higher. The only explanation of this fact seems to be that the solubility of the salt increases with the rise in temperature, thus giving a path of low resistance for the leakage current due to the increased amount of salt dissolved in the water. A steady light rain appears to reduce the ballast resistance more than a heavy rain, probably due to the fact that the heavy rain washes much of



Transmission Line and Control Wires at the Right New Alternating Current Signaling on the Grank Trunk in Illinois

cago carries a heavy traffic, including through passenger and freight, suburban passenger, and all Chicago freight transfer business. This work completes the automatic signaling of the double-track main line of the Grand Trunk from Chicago to Granger, Mich., approximately 108 miles.

UNUSUAL TRACK CIRCUIT CONDITIONS

The track conditions on this section of line made the operation of track circuits unusually difficult, and it is probable that certain of the blocks could never have been operated satisfactorily with ordinary direct current circuits. Two factors are principally responsible for this condition, the impregnation of the ballast and ties with brine drippings, and the high ground water level, found in the swampy country in which most of this section of the line is located. The Grand Trunk has had

the salt away, while the former allows it to more thoroughly impregnate the ties and ballast.

A further harmful effect of these brine drippings is that a coating of rust scale has been formed on the rails and angle bars; and this scale, being a good insulator, forces practically all of the track current to flow through the bond wires instead of a considerable portion flowing through the angle bars and the abutting rail ends. This materially increases the total rail resistance and impedance. A recent test on rails similarly coated in D. c. territory showed that the cutting of the bond wires at one joint in the eastbound track resulted in a reduction of the current through the relay of 40 per cent, while on the opposite section of the westbound track, under similar conditions except that the rail was practically free from scale, a similar cutting of the bond wires caused a reduction of only

11 per cent in the relay current. As a result of this test, three copper-clad bond wires were placed at each joint on the east-bound track, instead of two iron wires; but in certain cases even this treatment did not remedy the trouble, and where the length was over 3,000 ft. the section had to be shortened to secure satisfactory service.

On account of the comparatively short block length—averaging slightly less than a mile—which was found best suited to the traffic on the section recently completed, it was decided when the plans were made that it would be possible to operate A. C. track circuits of full block length in all cases. The circuits were installed according to this plan; but it was found that satisfactory operation could not be obtained during the warm summer rains, and 18 of the sections had to be cut in two, and in one case the length was reduced to about 1,800 ft. before satisfactory operation under all weather conditions could be obtained.

ADOPTION OF ALTERNATING CURRENT

In addition to the fact that the adoption of an alternating current system made it possible to install track circuits on a section which would have been impossible to operate with ordinary D. C. circuits, the availability of A. C. commercial power at reasonable rates, and the possibility of lighting the signals and the station buildings from the transmission line, were also important considerations. The lighting feature, especially, has proved most successful as shown by the fact that at present the lighting load is approximately twice the signal load. Power is bought under a wholesale contract at a cost of approximately three cents per k.w.-hour, and this cost will be even less as the load increases. Previously, these lights were supplied with current metered at many points at retail lighting prices, amounting to 8 ct. per k.w.-hour. This saving, if capitalized, would go a long way toward paying the first cost of the transmission line. A further advantage results from the fact that with cheap lighting the road equips electrically even its smallest stations within this zone, thus giving better service to the patrons of the road at a cost that is practically the same as for oil lamps.

In view of the numerous lines in this territory from which power could be obtained, it did not seem advisable for the company to generate its own current. A substation serving the entire line was put up at Elsdon, which is the center for the combined signal and lighting load, and power was secured from two independent 2,200-volt distributing circuits which cross the right-of-way a short distance each side of this point. In this substation, which is a portable 9-ft. by 13-ft. reinforced concrete building, the power is transformed to 4,400 volts, at which potential it is transmitted along the railroad to both ends of the section.

A steel core stranded aluminum cable of a resistance approximately equal to that of a No. 6 B. & S. gage hard-drawn copper wire is used for this high-tension line. The reasons that led to the use of aluminum instead of copper were: First, greater mechanical strength together with less weight; second, its greater ability to withstand rough treatment without serious damage; and third, a small saving in first cost. No. 10 B. & S. gage, 40 per cent bare copper-clad line wire is used for the low-tension control circuits and a clearance of 6 ft. is maintained between high and low tension lines. The high-tension transmission line is sectionalized at four points about five miles apart, thus minimizing the zone affected in case of a line failure.

SIGNAL CONTROL AND OPERATION

The transmission line voltage is transformed to 110 volts at signal locations, which is used for the operation of the 60-cycle single-phase induction motors in the G. R. S. model 2-A bottom post signal mechanisms. The 110-volt current is in turn transformed down to the track and lamp voltages, a separate track transformer being used for each section. The 3-position, upper quadrant signals are lighted by 2 c.p., 6-volt tungsten lamps, burning in multiple, which are operated on 5 volts. This has been found to give sufficient light and materially increases the life of the lamp.

Except in special cases, G. R. S. model 2-A, 3-position track relays, with 110-volt locals, are used in the signal control circuits. However, in a case where there are facing point switches in the block, a separate 45-deg. line control circuit is used, and this is broken through all facing-point switches. The switches are equipped with double shunt wires and this protection alone is relied on for the trailing point switches. Switch indicators are provided for all main line switches except those located in yard zones where switching is constantly going on. In these cases the indicators would be in the stop position so large a portion of the time as to be practically valueless. The indicators are normally energized, 0 to 90 deg., upper-quadrant semaphore type, it being thought that with the normally energized type there is less likelihood of trainmen neglecting to observe the indication. All indicators are clearly marked to show whether they refer to movements on the eastbound or the westbound track, such information being of material interest to trainmen, particularly at crossovers, in familiarizing themselves with the use of the indicators.

INTERLOCKING PLANTS

At the two interlocking plants within the limits of this installation, the mechanical home and distant signals on the Grand Trunk were replaced by 3-position, semi-automatic A. c. signals, incorporated with the automatic block system. Route locking was installed for the Grand Trunk high speed route, and detector locking is effective when the home signal lever is reversed. The latter feature allowed the removal of the crossing bars. For each route, disk type indicators are provided for the track sections between derails and for the track section extending from the backup dwarf signal to the next automatic block signal in advance. Semaphore type repeaters were provided in the towers only for the distant signals. Approach annunciators are not provided, except for eastbound movements in the Blue Island plant, a telephone circuit being installed in their place between Thornton Junction and the Harvey and Blue Island plants. The eastbound annunciator at Blue Island was necessary, since there is no interlocking west of that point for some 13 miles. Levermen are required to telephone the station in advance of the approach of trains. In addition, there is a listening set installed on the telephone train despatching line, allowing the levermen to get information from the despatcher.

This work has been installed under the supervision of the signal engineer's office of the Grand Trunk. We are indebted for the foregoing information to B. Wheelwright, assistant signal engineer.

ASK WHAT YOU WILL

W. T. Lechlider, superintendent of the Cleveland division of the Baltimore & Ohio, remarking that men in his position frequently are asked to recommend men for places in the railroad service, notifies all his employees to make their desires known. "It is a pleasure," says Mr. Lechlider, "for any superintendent to be able to respond to such requests. In order to do this it is necessary that the superintendent know what available timber he has to draw from . . . I shall be glad if all who aspire to any of these positions (subordinate official positions, including station agents and freight house foremen) will write me, in their own handwriting, giving a brief outline of their knowledge of handling such position as they aspire to. It is my intention then to talk to each applicant and if necessary put him in line to get hold of such reading matter as will best fit him for the desired position. At the same time I shall endeavor to satisfy myself as to the qualifications of aspirants for handling men forming a class which will meet at the headquarters building in Cleveland, at night, during the winter months, for the purpose of encouraging the movement."

Employees who have boys whom they want to start in railroad work are invited to send in the name, age, address and school education of the proposed candidates.

Operation of Parallel and Radial Coupled Axles

Possibilities of Increasing the Coupled Wheel Base to Secure Higher Tractive Effort from One Set of Cylinders

At the annual meeting of the American Society of Mechanical Engineers held in New York, December 7-10, 1915, a paper was presented by Anatole Mallet dealing with the operation of parallel and radial axles by a single set of cylinders. The study was of a historical nature, briefly setting forth the principal arrangements for accomplishing this purpose. The various systems of transmission were divided into two classes: those involving rotating elements, and those involving reciprocating elements. In the first class were included gear transmissions, transmission by endless chain and transmission by universal joints. To the second class belong such systems as make use of connecting rods located in the longitudinal axis of the engine, free axles, oscillating levers or equalizers, or external connecting rods of variable lengths.

Notwithstanding the difficulties this type of transmission involves, the author expressed his belief that in view of the ingenuity which has developed in the study of this question during the past sixty years and by so many inventors, a system may finally be found which combines all the conditions essential to the practical operation of such a device.

The paper brought out considerable discussion as to the future possibilities of increased tractive effort, from which the following extracts are taken:

E. A. Averill—It is possible in a two-clinder locomotive to obtain a tractive effort around 100,000 lb. as far as the cylinders are concerned. In view of the limitations of a satisfactory factor of adhesion and safe weight on each driving axle, such a tractive effort would necessitate the use of 12-coupled drivers, which means a driving wheel base of approximately 26 ft. 6 in. for drivers 60 in. in diameter. Such a rigid wheelbase would be impossible for ordinary use, with no arrangements allowing sidewise action of the driving wheels other than the setting in of the tires or the use of blind tires. We have reached a tractive effort of nearly 85,000 lb. and a wheelbase of 22 ft. It is not a very great step from that to 100,000 lb., a step that is desired and probably will be undertaken, but there is an important problem to solve in connection with this very long wheelbase.

W. F. Keisel, Jr. (Pennsylvania Railroad)—Apparently few of the designs shown in Mr. Mallet's paper have reached the experimental stage and none have come into general use. This is sufficient indication that their practicability is doubtful. Such schemes will probably never be adopted, their only advantage being that all the axles can be driven from a single set of cylinders.

The weight and size of modern locomotives are so great that the cylinder diameters are now as large as road clearances will permit. If larger locomotives are built, the application of two or more sets of cylinders will probably be obligatory. If the number of sets of cylinders is increased the Mallet type is the logical type to use, as no change in the customary construction of side rods, pins, etc., is necessary. In the Mallet type all necessary flexibility that may be required on account of track curvature can readily be obtained, making it unnecessary to consider further the flexible drive. Another reason why such types are not likely to come into practical use is that the loss in efficiency would be greater than the loss due to carrying 10 or 15 per cent of the weight of the locomotive on truck axles.

G. R. Henderson—When a large number of axles are operated by one pair of cylinders, we have the following objectional features: Large and unwieldy cylinder proportions and parts; great loads on rods, crossheads, guides and main crank pins; heavy rods and reciprocating parts; increased difficulty in lubricating the bearings and rubbing surfaces; greater labor

in making round house repairs and adjustments. When operating on the road the most objectionable feature is found in the loss of headway due to slipping of the drivers, practically stalling the train on heavy grades, whereas, in the Mallet type of locomotive, it is a well-known fact that the drivers of both high and low pressure units practically never slip at the same time. This is one of the most valuable features of the Mallet type locomotive and ordinarily is not given sufficient consideration in selecting locomotives for heavy drags.

W. E. Woodard (American Locomotive Company)-From the standpoint of tracking, the problem of operating a long coupled wheelbase with a single pair of cylinders could undoubtedly best be solved by arranging certain of the wheels so that they could deflect radially. However, this involves mechanical difficulties which, so far, have appeared to be difficult to solve, at least for heavy locomotives. A practical solution would seem to be a compromise construction which permits of lateral motion of certain of the coupled wheels in a plane parallel with the other coupled axles. A comparatively simple side rod construction can be used which will readily take care of the side motion required. The Zara and other similar truck constructions, which have been used abroad, are based on this general principle. Floating coupled axles in which an abnormal amount of lateral play is allowed to accommodate the curving of the wheelbase, have also been used abroad and to a limited extent in this country. Floating axles with lateral play will certainly allow long wheelbase engines easily to pass sharp curves, but their use is open to the objection that they do not contribute any guiding effort on curves, or steadying action on tangent track, until the full lateral play is taken up. Moreover, because such axles are free to move laterally, almost all the flange wear comes on those coupled wheels which have normal lateral play. The ruling of the Interstate Commerce Commission, lately made, covering allowable lateral play between driving wheel hubs and driving boxes, is also an objection to this construction.

There has recently been placed in service an arrangement of lateral motion coupled axle which meets these requirements. It provides sufficient flexibility to admit of a locomotive with a long driving wheelbase curving easily and at the same time affords a definite resistance against lateral motion. This design is in successful operation on a number of heavy 10-coupled locomotives on the New York, Ontario & Western and has also been used on a similar class of locomotives of unusual weight and power just going into service on the Erie Railroad. Briefly, the design consists of an arrangement which permits of about 2 in. total side play of the leading coupled wheels and boxes. This lateral motion is resisted and controlled by a constant side resistance which is obtained through the action of the load carried on the boxes. In this way, a positive gravity control is obtained against an initial side motion of the wheels and throughout the entire range of this motion up to its limit. The side rods connecting this pair of driving wheels with the second pair of wheels are arranged with ball knuckle-joint pins and a special design of spherical crank pin. The New York, Ontario & Western 2-10-2 type engines have 28-in. by 32-in. cylinders, 57-in. driving wheels, a rated tractive effort of 71,200 lb. and a driving wheelbase 20 ft. long. The Erie 2-10-2 type has 31-in, by 32-in. cylinders, 63-in. driving wheels, a rated tractive effort of 83,000 lb. and a driving wheelbase of 22 ft. 6 in. In both designs flanged tires are used on all the driving wheels. These engines pass readily around yard curves of 20 deg. without cramping or grinding, even though, in the case of the Erie engine, the coupled wheelbase is 22 ft. 6 in. long.

The principle of applying a yielding resistance to control the

motion of the driving axle having lateral play appears to be fully justified by the results of operation so far obtained. Observations of the engines in service show that there is no lateral motion of these wheels on tangent track and on ordinary line curves, even when the engine is working very hard at moderate speeds. The tire wear also appears to be about evenly divided between the first and the second driving wheels. These applications seem to justify the expectation that this construction can readily be extended to a 12-coupled locomotive having lateral motion driving axles front and back. With such a locomotive, a tractive effort of 100,000 lb. with a single pair of cylinders could be obtained within the limit of wheel loads which have been used on a number of existing locomotives. The construction is also applicable to Mallet locomotives, thus increasing the number of pairs of coupled wheels in each unit, with a corresponding increase in tractive effort.

Geo. L. Fowler-I have made a few investigations relative to lateral wheel pressures on curves, and have gotten astonishing results. There is one thing that stands out very clearly and that is the fact that the leading truck has a very material effect upon the distribution of the lateral thrust. I found that in negotiating curves, the leading truck of a Consolidation locomotive has the greatest amount of pressure on the rail, then comes the second driver, followed by the first driver, the third driver and fourth driver, in the order named. Turning the engine around and running it backward, the rear wheel strikes a tremendous blow and the rest of the wheels travel around with very little pressure. The same thing was manifest in connection with Pennsylvania electric locomotives. The leading driver on the rear unit put most of the pressure on the rail. I have never investigated the Mallet type, but I believe the blow from the leading wheel of the second unit would be a pretty serious thing at high speeds on sharp curves. As to switch engines and Consolidation locomotives running backward, I believe the speed of such locomotives should be limited to not more than 20 or 25 miles an hour.

The easiest riding locomotive is the old American type, followed by the Pacific type, if the weight is not considered. With the latter type the lateral pressure from the trailing wheel was invariably much higher than that from the rear driver. The pressure in the case of tenders was very light, but with a train negotiating a sharp curve at high speed, the effect of the locomotive is slight compared with that of the sleeping cars following. With a Pacific type locomotive pressures were recorded from 13,000 lb. to 14,000 lb. for a single wheel, followed by a sleeping car which would give pressures of 32,000 lb. to 36,000 lb.

In regard to the limitation of lateral motion in the driving boxes, I could find no difference in a large number of engines on curves, where the engine apparently bears over against the outer rail, but on tangent track side motion is an important factor. A dilapidated locomotive, with from $1\frac{1}{2}$ in to $1\frac{3}{4}$ in. side motion and just ready to go into the shop, passes over a tangent track with an ease that is surprising. With an engine just out of the shop, having about $\frac{3}{6}$ -in. lateral motion, heavy blows may be expected.

E. B. Katte (New York Central)—Some experiences derived in the development of the earlier types of high-speed electric locomotives do not agree with Mr. Fowler's experience in regard to lateral motion. We found in the early type of electric locomotive, which only had a two-wheel guiding truck, that if there were considerable lateral motion, either in running into a curve, or in running off a curve, there was a tendency to throw over from one side to the other. The effect of the low center of gravity was accentuated by the lost motion, and we would gradually get such a cumulative shock at speeds of 80 or 85 miles an hour that we would break the track, which was relatively light. Taking the same locomotive with hardly any lost motion, we could run it almost any speed without getting a knock against the rails.

C. D. Young-I can see no particular difficulty in reaching 100,000-lb. tractive efforts, but I do not believe that the use

of two cylinders is the way to do it. It should be done either with two pairs of simple cylinders, or with three simple cylinders. In that way the long overhang of the main pin, which would result from the wide spread, would be overcome, as well as the trouble with cylinder clearances. If the cylinders were made large enough to limit the full gear position to a reasonable cut-off, I believe a boiler could be made which would develop the possibilities of 100,000-lb. tractive effort. I see no use, however, for such a locomotive if the boiler will not supply the steam. There should be three or four cylinders large enough to permit the valve gear to be so arranged that the maximum cut-off would not be over 65 or 70 per cent, thus making it possible to develop full tractive effort at a reasonable water rate. The water rate of the two-cylinder engine, working full gear at seven or eight miles an hour, is about 31 lb. per hp. hr. with 225 deg. of superheat. If the cut-off is reduced 50 per cent the water rate drops to 18.5 lb. The difference in boiler requirements between these two gear positions is evident.

THE MODERN STATION AGENT

[From Sunset-Central Bulletin; letter from an agent in Texas.]

We are badly handicapped in many ways. P. D. Q. people have less rates on carload brick and tile to number of places, etc. Passenger fares less to nearly all points in Southeast. . . .

P. D. Q., twice as near town as we are, have better team track. Practically all industrial plants and warehouses located on P. D. Q.; less rental and easier to make contract with. For instance, we charged industry something like \$350 to put in siding and \$22 year rental on rails for some six or eight years, while P. D. Q. put in more track and charged nothing. . . . We charge \$25 per year rental on small strip of right of way—P. D. Q. charges nothing.

Western Union Telegraph office is in the other fellow's depot. Some message passes with reference to nearly all carload shipments bought or sold, either quotations, confirmation or when will be shipped. Consequently the other fellow gets all this valuable dope hot from the bat, while we have to dig hard to get information with reference to movement carload shipments, visit all stores and offices, stay on best of terms with all patrons and clerks, do a thousand and one little favors in order to keep them under obligations to us, hold membership in all the different lodges, subscribe liberally to support all religious and benevolent institutions, and besides we have to be a "good fellow," keep the county officials all lined up on best of terms in order to keep them from romping on us, calling our road an octopus and other ugly names. We've got to stay on the best of terms with the farmer. If he is not our friend we are a failure. We get stuck for big verdicts and have lots of lawsuits unless we keep the farmers lined up in good shape and boosting for us. To do this we have got to do many little favors for him, meet his kin folks that come in on nights trains, keep them over night or see that they get a way to get out; call him up over rural phone often; give him any information that you think will be worth anything to him and, above all things, we've got to "always" be pleasant; smile day and night. . . .

The public expects ten times as much of an agent as it did ten years ago. Today he is a fellow citizen—liked or disliked; has got to be a burden bearer; taxpayer; a permanent fixture in the community. Agents that chase from pillar to post, transferring from this station to that, cannot hope to be a success either for themselves or the company. They do not stay in one place long enough to make warm friends and gain the confidence of the traveling public. The boomer agent is out of date.

Last but not least, all officers expect much more of an agent than they did ten or fifteen years years ago. Traffic officials, claim agents, law department, as well as transportation officials expect the agent to be "always on the spot."

A United States United for Trade in Foreign Lands

American Railway Supply Firms Must Organize for Export Business. German Kartell and French Comptoir

By Walter S. Hiatt

Our Special European Correspondent

That not only American manufacturers of cotton goods, of soaps, of tooth brushes, of canned and food stuffs, but that railway supply firms must also unite for selling in foreign countries is the truth now being proclaimed throughout trade circles in the United States.

While this article is being written, the Federal Trade Commission, through consuls and commercial attaches, is obtaining more complete data concerning the workings of the German and French organizations which made it possible for manufacturers in these countries to operate profitably in their home markets and to prosper in foreign ones.

Because of the old antagonism on the part of the public towards the American trust, concretely evidenced in the Sherman Act regarding restraint of trade, this truth of the necessity of union is being advanced timidly. It is being presented in the form of a discussion that seems academic in the light of the facts; in the light of the fact that the United States will fail of its present great opportunity for foreign trade if its manufacturers do not unite; in the light of what has been accomplished in the past by Germans in particular, and in the light of the far-reaching combinations that existed in these countries before the war and which will draw their lines tighter after the war. France, for instance, which before the war had her comptoirs, her 150 co-operative trade associations, one of which was organized for mutual help in every branch of industry in a way that Americans have never dared, is now, with her war in full swing, laying her plans to overcome German or any other competition sure to come after the war is over. There are already whispers, even, of not only a munitions but a trade combination among English, French, Italian and Russian industries as against the world.

The big fact that stands out today that must be recognized and which a close consideration of German business has revealed, is that only in union and organization can there be strength. The whole of Germany as it was must be considered one vast commercial trust, not a trust that wiped out the little fellows, that favored the strong at the expense of the weak but as a trust that led to the mutual prosperity of all her industries. The Germans thereby were able to conquer foreign trade in any field; they alone really understood the value of patient work for a common end and the value of advertising whether in the form of a printed page, a traveling salesman or a branch house in a foreign field.

An extensive study of the French co-operative system of comptoirs is being made by the federal commission as outlined in the Railway Age Gazette of October 8, because it seems the system most easily adapted to the American temperament and laws, at least from the standpoint of foreign trade.

But why study this system if it was not able to stand up against the German kartell system? As a matter of fact, in so far as concerns the steel industry, it was able to stand up, and was beginning to hold its own against the German industrial invasion when the war came.

DISTINCTION BETWEEN SYNDICAT AND COMPTOIR

The French system, as concerns the iron and steel trades, is at bottom a gentleman's agreement among manufacturers for the selling of their products. There are two loose distinctions to be made in the organizations that have grown out of this agreement. One class of organization, such as the Comite des Forges de France, is maintained for the general welfare of the indus-

tries involved and concerns itself largely with questions relating to the improvement of the industries, with labor questions and with bringing together more closely the various mine, mill and factory owners of France. A second class of organization, known as the comptoir, deals with questions of selling. This latter class operates under the law of associations of 1877; the former works under the law of 1884, permitting the establishment of chambres and syndicats, both of employers and employees, but forbidding them to concern themselves with commercial matters, such as the fixing of prices.

There is not an iron or steel manufacturer, big or little, in France, who does not belong to one or the other or both of these two classes of organization. Yet every firm maintains its personality and individuality, and does business as it pleases so long as it does not violate any agreement it may have made with the other members of the organizations.

The second class of organizations, the comptoirs, is subdivided into many little groups for the purpose of selling particular kinds of products, in which the cost of production is virtually the same and where the finished article should sell at the same price. This is an important fact to be borne in mind. The owner of a steel mill or plant engaged in the manufacture of several lines of articles may conduct his sales along certain lines, and indeed does conduct his own selling campaigns so far as concerns products for which there is sharp competition or products which have distinctive qualities, as in the case of locomotives. On the one hand, two locomotive manufacturers may belong to the same chambre or syndicat, regulating questions of welfare and production and yet be sharp competitors in the market.

But so far as relates to their gross products, say steel beams, or channels, or angle irons, their sales are done through a comptoir, which may have 10 or 20 members, each member playing in this case merely the role of producer.

A further subdivision of the comptoirs or the second class of organizations is the export comptoir, which is entirely separate from the national comptoir. In general, it is the business of these comptoirs or sales clearing houses to prevent disastrous price-cutting, to reduce sales expenses, and to regulate production according to the demand, or, if there is an over-production, to dispose of it in a foreign market.

A notable example of such a comptoir is that known as the Comptoir des Poutrelles (beam counter) at 80 rue Taitbout, Paris, representing 20 great factories of France. One of its members, for instance, is Schneider & Co., of Creusot, the famous makers of arms, cannon and locomotives. This comptoir has no concern in the business of Schneider & Co. except as the latter is a manufacturer of beams and wishes to sell them in France or its colonies. The Creusot company must sell through this comptoir for this territory so long as it continues its membership.

This comptoir, like all other comptoirs, is a corporation with by-laws governing its members, of which at present there are 20. It was established by seven firms in 1896 for a period of 15 years, and in 1910 it was renewed for a further period of 20 years, thus indicating its satisfactory results. Its director, Monsieur Alphonse Longueval, pointed out to me that: "Whenever there is any disagreement among members as regards their share of contracts, we rarely fail to arrange such disputes by arbitration." The corporation has a nominal capital of a little over \$30,000 divided into 319 shares of \$100 each. This capital really

serves for operating expenses for the sales bureau. At the end of each year the profits are distributed as follows: first, one-twentieth part is set aside as a reserve fund, then a dividend of 5 per cent is paid on the shares, and the balance, if any, is apportioned according to the share-holding of each member. This annual settlement, however, is independent of the settlements which must be made to the members furnishing the greater quantities of beams or other like material sold, since it may well happen in any one year that one member does not care to manufacture any beams at all, or else in the quantity needed by the customers of the comptoir, because of other activities of his plant.

THE ORIGIN OF THE COMPTOIR

To understand the purely selling nature of these comptoirs and to see that they are not considered by French law as combinations in restraint of trade, it is well to point out that they had their modern origin in the need of mine and mill owners of the celebrated ore and mill center of Longwy to sell their products and save themselves from failure.

The word comptoir has an old meaning and dates back several centuries to the time of the guilds and merchant corporations, such as that first chamber of commerce established at Marseilles in 1599. To Europeans the comptoir was once what a trading post was to ourselves on the Indian frontiers. The word comptoir itself took its meaning from the long table in the European trading centers over which money was paid for goods spread out there. The most prosperous of the old comptoirs were those maintained by the Hanseatic League at Antwerp, with branches in the Low Countries, Russia and Norway. These comptoirs consisted of immense buildings containing living rooms and warehouses and to these posts came merchants from all over Europe, as in modern times they came every March to the German trade exchanges and expositions at Leipsic or as buyers and sellers will come to the international Foire to be held at Lyons, France, next March.

As quicker means of transportation were developed and as political security improved, these comptoirs decayed and were finally done away with by law in France. They were revived in a modern sense in France by four mill and mine owners at Longwy under the associations law of 1877. The comptoir thus founded exists now and for the same selling purpose under the name of the Comptoir Metallurgique de Longwy, numbering nine members. No less than 75 other such groups have been since organized under other names, representing several hundred different mills and factories, and all with the same object—profitable selling.

Be it noted fully that the Longwy comptoir was not founded to limit output or regulate prices. Its four original members put their heads and capital together for the purpose of advertising a new product which they had just been able to obtain and at the same time to overcome the disrepute into which their old products had fallen. While their mines and plants had been worked for 60 years, the Germans in the war of 1870 had taken away their best ore fields through the annexation of Lorraine, and left them the tainted phosphorus ores. Then Gilchrist discovered how to use ore so tainted and these four men saw that their ore, if they could make it known, would revolutionize the iron and steel industries of France and turn the poor fields into the richest of Europe. Through their united efforts they made their metals widely used and at the present day these ores and mills constitute one of the greatest sources of French national industrial wealth, a wealth so great that the Germans in this present war hoped to take what they neglected

With the Waldeck-Rousseau law of 1884, repealing the old law of 1791, forbidding the formation of trade or professional associations, many other mutual help associations were formed in France under the name of syndicats, either by labor or industrial classes. This law also stimulated the formation of comptoirs, such as that of Longwy.

THE COMITE DES FORGES DE FRANCE

The most notable of the industrial associations, one purpose of which is the encouragement of comptoirs, is the Comite des Forges de France, which numbers some 20 principal members and may be said to unite under its roof at 7 rue de Madrid, Paris, the iron and steel manufacturers of France, together with their most important subsidiary organizations. One of these latter is the Union des Industries Metallurgiques et Minieres, counting 85 members and representing 50 industrial syndicats, including manufacturers of arms, bicycles, automobiles, general machinery, copper, steel and electrical apparatus. Another organization is the Chambre Syndicale des Fabricants et des Constructeurs de Materiel pour Chemins de Fer et Tramways. All of these organizations have the same common general secretary, Monsieur Robert Pinot, a man of rare tact and executive ability, whose business it is to know everybody and everything, and to placate and smooth over the inevitable difficulties that arise between competitive members, or in connection with the vast interests of the industries.

History probably does not afford a more striking example of uncoerced co-operative work than is found here under this roof. The fabric of the organization, with its varied relations, depends entirely on friendly helpfulness and were this pervading spirit removed or did any group of men attempt to control it, the whole fabric would tumble like a house of cards.

An interesting illustration of the work of the Comite des Forges de France has been provided during the present war. It has long since become a matter of popular information that the German invasion in the north of France cut off 80 per cent of the mines and mills of the nation. Yet mine and mill products had to be secured for the manufacture of cannon and bombs to supply the army. Through this central committee this vast work was undertaken and so successfully carried out that for many months France has been taking reasonable care of her own armies and also providing those of Russia. Glove, button, lace, automobile factories, railroad shops, printing offices, were converted to new needs and taught how to make these needed supplies. The same task was undertaken in unorganized England, the old home of the steel product, but France distanced her in the task, her output running twice that of her ally.

How Can Americans Profit by This Example?

On one of the days that I visited the offices of the comite, several groups of manufacturers were sitting in different parts of the building, considering methods of improving their product, of increasing it, of getting new factories to work or of finding new supplies in the world's markets.

During one of these visits, I asked Monsieur Pinot what he thought of the possibility of adapting French co-operative methods to our own, if only for foreign selling. He answered as frankly and fully as he could, with the limited time at his disposal, first expressing the thought that every nation possesses or develops a temperament which translates itself into its methods of doing business and which prevents it from following too closely that of any other nation.

"There are three different national methods of doing business," he explained. "In America there is the so-called trust method, where separate lines of business have fallen into the hands of dominating groups intolerant of interference or co-operation. The Germans developed the kartell system which, while doubtless suited to them, eliminated the spirit of independent competition in fact, though it may not crush the little fellow. It is a machinery in which every man is a cog and must stay a cog. In France our temperament won't let us be dominated; so there came about the co-operation which, while giving to each certain benefits, leaves him free on the whole to conduct his business as he likes. I have purposely left out England, because there they have no system at all capable of classification. It is every man for himself."

On the question of a union of manufacturers for foreign trade he said: "Manufacturers can use the comptoir system of sales only for articles having a uniform price. It is all right for a half-dozen manufacturers of beams or nails or car wheels to get together and appoint a common foreign selling agent, this agent to be paid equally by them and they to share equally in any sales made, no matter to which firm the sale goes. But when it comes to highly technical material like locomotives, the plan cannot work. We have never worked such a plan on our comptoirs. Each man makes a different kind of a machine, with its particular merits, and the buyer is sure to select two or three or four of the kinds offered. What becomes of the two fellows who are not selling? They become disgruntled and pull out of the combination. I think that is common sense."

Regarding the general nature of the work of French co-operative and comptoir organizations, Monsieur Pinot very explicitly denied that they attempted to fix or control in a narrow measure the prices of products. "If the impression gets to America through the reports of your consuls that we are a trust, we can't help it," he said. "If you take another man's picture and send it to America and label it as mine, the fact isn't changed that the picture is not mine. The work of the Comite des Forges de France is positively co-operative, and so far as we are able—and our only force is moral suasion—we keep the big fellows from swallowing the little ones. Should we fail in that, our usefulness would cease."

FOREIGN TRADE COMPTOIRS

A comptoir essentially like that of the Comptoir des Putrelles, except that it is for foreign trade only, is the Comptoir d'Exportation des Produits Metallurgiques, 7 rue Pillet-Will, Paris. It has a capital of \$10,000, which it uses for operating expenses, including salesmen and advertising. It limits its sales to rails, I-beams and U-beams of certain sizes, channels and profiles. While before the war it had, together with other French comptoirs of a similar nature, the German kartells, and certain American firms, certain territories of the world divided up and classified for sales, those agreements have in a measure been cancelled by the war.

The same method as expressed in such comptoirs has been outlined by William S. Kies, of the foreign department of the National City Bank, of New York, and is well worth study by those interested. He reasons that the Sherman Act will not be violated by the formation of a co-operative corporation. He has written: "Let there be organized under the laws of one of the states a corporation to be known, for example, as the American Drug Manufacturers' Export Corporation, the American Coal Producers' Export Association, or some similar title." He then proceeds to explain how such an organization can pool its sales and shipping expenses, secure quick and accurate information in the particular line interested, and unshackle in many other ways American foreign business. "The possibilities of our commercial future carry a striking appeal even to the ordinary imagination," he says, and concludes: "Whether the great opportunity in the nation's history will be taken advantage of in full measure, to the lasting benefit of the whole people, will depend upon the education of our people to the value to this country of export trade; upon the development of a genuine spirit of co-operation among our manufacturers in the intensive study of the possibilities of new markets. . . .

TAKING ADVANTAGE OF PRESENT CONDITIONS

Here is one very important fact which any manufacturer can himself verify: no American firm that has in years past seriously undertaken to establish himself in the foreign trade, can be said to have failed to do a reasonably good business. This fact is attested by the existence of a number of firms still doing business in various foreign countries. It was cited to me by various Americans abroad and in particular by the representative of an American credit agency, which has branches in every part of the world and whose business it is to inform both American and foreign subscribers concerning the reliability of the people with which they intend to do business.

There is an immediate problem now facing those Americans

who wish to push their foreign business. It will probably take several months to perfect any extended co-operative system or to secure a modification of the Sherman Act through the aid of Congress or the Federal Trade Commission. From talks with many Americans already established in the foreign field, the best cooperative plan to be followed now would seem to be for several railway supply firms unwilling to send out their own personal representative, to join hands in an unofficial way, select a given territory, whether in Europe or South America, and place in that territory a trusted American salesman fairly familiar with each of the firms and the products to be sold. This same plan has been worked out right in the United States by private enterprise; that is, by some one man representing in a given territory, such as that of Chicago, a number of houses on a pure commission basis. But the expenses and time required for a man to go abroad and run the risks of a long period of waiting before making sales would not make it appear profitable for private enterprise to do what the manufacturer himself should do.

Just now there is an unfortunate tendency by American firms, in their haste to get new business, to appoint in foreign fields natives of the country as their agents. While it is true that this method brought prosperity to countless English firms, it is certainly not a good plan at present. By following this scheme a great many firms are going to become sadly involved, suffer losses, and perhaps be disgusted forever with attempts to sell in foreign lands. An American salesman representing a big American firm abroad said to me in this connection recently: "The man who puts his agency in the hands of an Englishman, a German, a Frenchman, a Russian, or what not, is going to get bit in the long run. Suppose the agent is honest, he doesn't know home methods, he doesn't know the members of the firm, he doesn't know home conditions, and this is positively essential to doing business at two ends. Another point-the average foreigner hasn't got business in his soul."

In the past there have been many important exceptions to this rule, always so closely adhered to by the Germans, of having a salesman of one's own nationality. It has been the custom all over the world for one important firm in one country to secure as its agent in another country a firm equally as reliable and important as itself and in precisely the same line. For instance, the Lackawanna Steel Company has as its foreign agents for France, Italy and Spain and their colonies the French company of Forges et Acieries de la Marine et d'Homecourt. On the surface, this plan would seem to have many advantages, since such a French firm is well established, its credit is unquestioned at home, and the fact of its offering to fill a contract is a guarantee to the buyer that the contract will be fulfilled, no matter where the product is obtained, and this same buyer would certainly hesitate to place a contract with an American firm unknown to him. On the other hand, such a foreign firm would probably give to the American firm only the leavings of its business. As it does not know thoroughly the home office of the American firm, perhaps the best connection of this sort would be to have a representative of the American firm on the ground to work in co-operation with the foreign firm.

Such a connection, however, can only be considered by very large firms. Just how ridiculous are some of the foreign agency connections now being made by American firms can only be realized by American observers on the spot. The international business fever is not limited to Americans. All over the world men with and without business qualifications are seeking the agency of American firms. I know of one man in Paris, formerly engaged in exploiting amusement enterprises, who is now launching out into agency representation. He claims to have to date French territory contracts with no less than 45 American firms. It is safe to say that he does not know the products of these firms, their special qualities, nor the market conditions for handling them in France. I know of a head waiter in a hotel, closed up because of war conditions, who had some letter heads printed and is now seeking representation of American firms, many of them of a high order. While he is not asking

money advances, he has no capital to keep himself going. There is but one chance in a thousand that he may make sales.

American firms receiving such letters, if they are inclined to consider them favorably, should begin by making inquiries of the credit associations with foreign connections to which they belong for a report on the writer. Yet they are not doing it. Nor are many of the Americans who come abroad consulting the foreign representative of a well-known American credit association with branch offices all over the world. While all European business, whether wholesale or retail, is now done on a cash payment basis, houses that were in good condition before the war have not by any means been ruined, and a report on them can easily be obtained.

The sooner Americans learn that the principles of doing business over here are much the same as those at home; that, barring tariffs and shipments and the temperament of the people, business is not vastly different at bottom from that of doing business between New York and San Francisco, the quicker they will begin making money.

ANNUAL REPORT OF THE CHIEF INSPECTOR OF LOCOMOTIVE BOILERS

As required by law a report of the work of the division of locomotive boiler inspection has recently been made to the Interstate Commerce Commission by Frank McManamy, chief inspector of locomotive boilers. This is the fourth annual report and covers the fiscal year ending June 30, 1915. The following is taken from the report:

The tables show in concrete form the number of locomotives inspected, the number and percentage found defective and the number ordered out of service on account of not meeting the requirements of the law during each of the four years the law has been in force. They also show the total number of accidents due to failure from any cause of locomotive boilers or their appurtenances and the number of persons killed or injured thereby, with the percentage of decrease each year since the law became effective; also the total decrease during that period.

	1915	1914	1913	1912
Number of locomotives inspected	73,443	92,716	90, 346	. 74, 234
	32,666	49,137	54, 522	48, 768
	44.4	52.9	60. 3	65. 7
	2,027	3,365	4, 676	3, 377

Locomotives Inspected, Number found Defective and Number Ordered Out of Service

	1915	1914	1913	1912
Number of accidents. Becrease from previous year per ceut. Decrease from 1912 do Number killed. Decrease from previous year per cent. Decrease from 1912 do Number nipured. Decrease from 1912 do Decrease from previous year per cent. Decrease from previous year do Decrease from previous year do Decrease from previous year do do do	424 23. 6 50. 5 13 43. 5 85. 7 467 24 53. 5	614 32.6		856 91 1,005

Number of Accidents, Number Killed and Injured

The accompanying table shows the total number of persons killed and injured by failure of locomotive boilers or their appurtenances during the past four years, classified in accordance with their occupations.

All accidents reported have been carefully investigated, the cause determined, when possible, and the information thus obtained given to the carriers; and this has been an important factor in reducing the number of accidents.

Prompt reports of accidents materially assist in the work of investigation and reduce the delay to equipment, and as carriers now fully understand the requirements in this respect such reports, with rare exceptions, are properly made. While the total number of accidents has greatly decreased, two particular types show an increase over the previous year. These are accidents

due to defective blowoff cocks and to injector steam pipe failures.

During the year there were 20 accidents due to defective condition of blowoff cocks or other operating mechanism, resulting in 1 killed and 19 injured. The fact that every one of these accidents was due to defects in the blowoff cock, or in the piping or operating mechanism, which could have been discovered by reasonable inspection, clearly indicates that these appurtenances are not receiving the same careful inspection and attention that other appurtenances are; therefore, the remedy is obvious.

Twenty-eight accidents due to failure of injector steam pipes, resulting in one killed and 30 injured, occurred during the year. These failures can be divided into two general classes, viz., failure of union nut and failure of brazing sleeve or collar, both of which are in many instances contributed to by failure to properly brace the injector.

Failure of union nut is usually due to thread stripping, nut too large, or nut broken, which in practically every instance was caused by the use of improper tools, such as hammer and

			Ye	ear ende	d June 30	-		
	-19	15	1914		1913		1912	
	Killed.	In- jured.	Killed.	In- jured.	Killed.	In- jured.	Killed.	In- jured.
Members of train crews:								
Engineers.	5	150	8 8	187	12	268	22	310
Firemen	7	207	8	290	12	478	19	491
Brakemen		40		46	6	79	8	79
Conductors	1	4	1	6	2	7	4	16
Switchmen		4		1		2		1
Roundhouse and shap employees:								
Boiler makers		5	1 1	18		10	2	3
Machinists		10	2	5		11	7	11
Foremen		2	1	6		4	1	4
Inspectors		3		3		3	1	1
Watchmen		1	1	7		8	3	(
Boiler washers		9		8		4	1	4
Hostlers		6		9	1	6		
Other roundhouse and shop em-								
ployees		2	1 1	17	1	24	14	62
ther employees		2		10		4	3	3
onemployees		1		1	2	3	6	2
· · · · · · · · · · · · · · · · · · ·							_	
Total	13	467	23	614	36 !	911	91	1,005

Total Number of Persons Killed and Injured by Failure of Locomotive Boilers and Appurtenances, Classified by Occupations

chisel, or set in tightening the nut; and our investigations have shown that the use of such tools is not confined to the enginemen on the road where proper tools are not available, but can be said to be almost a general practice of repairmen at terminals. While the failure does not always occur at the time the improper tools are used, it results in stretching or otherwise damaging the nut, ultimately resulting in failure which frequently causes injury.

Failure at brazing sleeve or collar is usually due to poor brazing, allowing the pipe to pull out of the sleeve, or failure of sleeve due to the fact that the spelter did not flow between the sleeve and pipe, resulting in the sleeve being brazed to the pipe only at its extreme end; therefore, the strain of the load and vibration, which should have been borne by the copper pipe, is thrown on the brass sleeve, which is not designed nor intended to carry it.

Investigation of all such accidents which have occurred during a period of more than four years has convinced us that failure of brazing or brazing sleeves can be practically eliminated by the adoption of what has been termed a "mechanical joint," which is made by extending the copper pipe through the sleeve, expanding it, and beading or flanging it over so that it will be firmly held in the union. This not only throws the load on the pipe, which is designed to carry it, but also makes it possible to determine by inspection before the pipes are applied whether or not the work has been properly done, which is not possible with the brazed joint.

We have been persistently recommending this form of joint, and as it is being adopted by many carriers and manufacturers as standard, we have refrained from recommending a rule requiring its use; but unless a reduction in accidents from failure of steam pipes at brazing sleeve can otherwise be brought about, some action in this direction will become necessary.

The number of applications for an extension of time for removal of flues, as provided in rule 10, has increased over the previous year, and this has materially added to the work of this division, as such extensions are granted only after a special inspection of the locomotive has been made. During the year, 1,099 applications for extension of time for removal of flues were filed by 284 carriers; of this number 638, or 58 per cent, were granted; 461, or 42 per cent, were refused or granted only after defects disclosed by our inspection had been properly repaired.

The rule referred to requires all flues to be removed at least once every three years and a thorough examination made of the entire interior of the boiler; that after flues are taken out the inside of the boiler must have the scale removed and be thoroughly cleaned. The rule also provides that this period may

Nature of failure or defect. 1915 1914 1913 1912 1918						Year	ended	June	30-				15
Arch-tube failures. Blowers defective. 11			1915			1914			1913			1912	
Ash-pan blowers defective.	Nature of failure or defect.	Accidents.	Killed.	Injured	Accidents.	Killed.	Injured.	Accidents.	Killed	Injured.	Accidents.	Killed.	Injured
A Shell explosions. B. Crown-sheet failures due to low water where no contributory causes were found. The contributory causes or defects were found. C. Crown-seet failures due to low water where contributory causes or defects were found. D. Fire-box failures due to defective staybolts, crown stays, or sheets. E. Fire-box failures due to defective staybolts, crown stays, or sheets. E. Fire-box failures due to defective staybolts, crown stays, or sheets. E. Fire-box failures due to defective staybolts, crown stays, or sheets. 1 2 4 1 7 5 8 8 1 1 1 Cross stay defective. 1 1 1 2 1 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Ash-pan blowers defective Blowers defective Blow-off cocks defective Boiler checks defective	5 20	1	11 5 19	5 11 15	1	5 11 15	14 13 16	1	14 13 18	3 11 23	2	12 22
Crown-sheet failures due to low water where contributory causes or defects were found. 14 7 20 36 13 59 44 23 67 69 65 129	A Shell explosions. B. Crown-sheet failures due to low water where no				1		1				3	27	41
Description	C. Crown-sheet failures due to low water where	14	7	20	36	13	59	44	23	67	69	€5	129
Stays, or sheets	fective staybolts, crown	9		14					6				
The content of the	stays, or sheets	1	2		4	1	7	5	-	8	1		1
Dome caps defective	Cross stays defective.	1		1	1			1			14.1	3	
Fire-hose failures.	Draft appliances defective Exhaust nozzle breaking			3 2	1			4		4	3		
File sheats defective. Gauge cocks defective. Gauge cocks defective. Grates defective. Grates defective. Injectors and connections defective (not including injector steam pipes). Injectors and connections defective (not including injector steam pipes). Injector steam-pipes). Injector steam-pipe failures. Injector steam-pipes). Injector steam-pipes). Injector steam-pipes injector. Injector steam-pipes injector. Injector steam-pipe failures. Injector steam-pip	Fire doors defective	41		52	3 51				1			ï	62
Grates defective Handhole plates defective. Handhole plates defective. Lipectors and connections defective from the inding injector steam pipes. Steam-pipe failures. 28 1 30 15 13 36 47 31 38 11 38 12 12 12 12 12 12 12 12 12 12 12 12 12	Flue sheats delective							1 2	. ,	1 2	3 2		4 2
Steam pipes 29 31 33 33 25 28 47 38 1 1 1 1 1 1 1 1 1	Handhole plates defective Injectors and connections de-				1		1	1		1			
Mud ring defective 1	steam pipes) Injector steam-pipe failures Lubricators defective Lubricator glasses bursting.	13		30 8 14 2	15 14 20 8		18 14 20 9	36 11 45		47 12 45	31 11 49		38 12
Plugs (fusible) defective 2 2 1 1 1 1 1 1 1 1	Patch boits defective	····i		····i							1 2		1 4
Rivets defective	Plugs in fire-box sheets defective Plugs (fusible) defective Plugs in steam chest defective				2		2	1		1	1		1
Stay bolts defective	Rivets defective	1 2 99		1 2	4		5 1 140	2 1 266		2 1 267	243		245
Superheater-tube failures	Stay bolts defective Steam-heat hose defective Steam piping defective	3 1 4		5 1 4	14		16	1 5		6 21	11	_	····ii
Valves defective (not including safety valves) 8 8 3 3 6 6 5 2 4 Water-bar failures 1 1 2 2 1 1 3 3 1 2 1 1 2 2 1 1 2 2 1 1 2 2 1 2 2 1 <td>Tank hose defective</td> <td>1</td> <td></td> <td>3</td> <td></td> <td></td> <td>2</td> <td>3</td> <td></td> <td>3</td> <td>1</td> <td></td> <td></td>	Tank hose defective	1		3			2	3		3	1		
	Valves defective (not including safety valves) Water-bar failures Water glass bursting	48		1 48 3	3 2 60		60	1		1	165		168
	Miscellaneous	424	13	467	555	23	614	820	36	911	856	91	1,005

Accidents and Casualties Resulting from Failures of Locomotive Boilers and Their Appurtenances

be extended upon application if an investigation shows conditions to warrant it. Removal of flues once in three years is required primarily to allow a complete interior inspection, as provided by Rule 11, and making the necessary repairs, and not, as some evidently believe, on account of the condition of the flues.

To properly handle this work, carriers have been asked, when an extension is desired which their inspection indicates conditions warrant, to file applications with the chief inspector approximately 60 days before flues become due for removal, and in each case show:

- 1. Number of each locomotive for which the extension is desired.
- 2. Class of service in which the locomotive is engaged.
 3. Date of previous removal of flues.
- Date of previous removal of flues.
 Mileage made since flues were removed and interior of boiler cleaned and inspected.
- and inspected.
 Period of time for which the extension is desired.
 Approximate date when it will be convenient to have the locomotive held and dome cap and throttle standpipe removed to permit an interior inspection by a government inspector; also at what point locomotive will be held for this inspection.

It is to be presumed that carriers desire to properly maintain their locomotives; therefore, an application for an extension of time for removal of flues from a locomotive, which we find on examination to be defective, indicates that the railroad company's inspectors have not discovered the defective conditions.

In some instances it is evident that the application for extension of time has been filed without a proper attempt on the part of the carrier to determine whether the condition of the boiler would justify the application, as Federal inspectors find defects that could scarcely be overlooked if a reasonable inspection were made prior to filing the application, thus making it apparent that they are depending on us to do this work for them. When the conditions found indicate this practice exists, and that careful inspection is not being made by the carriers prior to filing application for extension of time, so they may know their request is a proper one, it becomes necessary for our inspectors to exercise extreme care in making their investigation, and to require the removal of all parts necessary to assure themselves whether or not the request for extension of time may properly be granted.

Alteration reports which are being filed, showing reinforcement of boilers which have a factor of safety below the standard fixed by the order of the commission, dated June 9, 1914, indicate that diligent efforts are being made by the carriers to meet the requirements of that order, and with a few exceptions very satisfactory progress is being made. A standard alteration report, Form 19, containing carefully prepared instructions for filing such reports in accordance with rule 54, was issued on March 29, 1915. The use of this form in accordance with the instructions will simplify the reporting of alterations to boilers and enable the carriers to avoid considerable unnecessary work which some of them have been doing.

The act of March 4, 1915, amending the locomotive boiler inspection law by extending its provisions to include the entire locomotive and tender and all their parts has presented additional and important problems and will materially increase the work of this division. The preparation of rules fixing minimum limits for all parts of locomotives and tenders, so that the requirements might be definite, has been diligently pursued and is progressing as rapidly as accuracy will permit.

Very satisfactory progress is being made in arranging the work of the division so that the additional duties imposed by the law may be properly performed. This will probably make it necessary for our inspectors to follow more closely the requirements of Section 6 of the law, which provides that their "first duty shall be to see that the carriers make inspections in accordance with the rules and regulations established or approved by the Interstate Commerce Commission, and that carriers repair the defects which such inspections disclose," before the locomotives are again put in service, and may result in eliminating reports to railroad officials of minor defects discovered by federal inspectors, which, for the benefit of the carriers, have been directed to their attention; therefore, it will be necessary for each railroad company's inspectors to give more careful attention to such matters, as no change will be made in the method of handling violations of the law or the rules.

No formal appeal from the decision of inspectors, as provided in Section 6 of the law, has been filed during the year. In one instance, an appeal was filed from the findings of inspectors in an accident investigation. Reinvestigation by an assistance chief inspector, assisted by inspectors from other districts, not only sustained the original report but disclosed additional evidence in support thereof.

During the year 2,130 defective parts of locomotives not covered by the boiler inspection law, almost all of which were defective wheels, were reported to this division by inspectors and directed to the attention of the railroad officials with request that proper repairs be made before the locomotives were put in service. Such matters are now covered by the amended law, and will be handled in accordance therewith.

HOWARD ELLIOTT ON CONGESTION IN NEW ENGLAND

Howard Elliott, chairman of the New York, New Haven & Hartford has addressed the following letter to the Interstate Commerce Commission, the Public Utilities Commission of Connecticut, the Public Service Commission of Massachusetts, the Public Service Commissions of New York, and the Public Utilities Commission of Rhode Island:

"I desire to submit to you on behalf of the New Haven company and its allied lines a statement about present conditions due to congestion of business on its own lines, congestion in and around New York harbor, and on many of its connecting lines, conditions which have been made much worse by the great storm of December 13-14, which seriously reduced the ability of the railroads to give a maximum amount of service with the facilities at hand; -- and by the storm of December 26, which did much damage and destroyed and retarded the work of restoring wire communication by telegraph and telephone, and of clearing the road of delayed freight. Prior to the great storm of December 13-14, the New Haven road, with facilities that in many places are wholly inadequate, had been doing the largest volume of business in its history, and has been performing a task in handling that business which is taxing its physical facilities. The volume of business may be evidenced by the following figures showing the number of cars of freight loaded locally on New Haven rails and the number of loaded cars received from connections for the first eight days of a number of months in 1915 as compared with the same eight days in the same months in 1914 and 1913:

	1915	1914	1913
August	40,824	40,932	42,829
September	42,484	39,626	39,487
October	47,361	43,360	44,673
November	47,766	39,176	45,621
December	50,677	37,748	44,193

"The New Haven road has on its rails to-day nearly 46,000 freight cars, which is about 8,000 cars more than it had a year ago, and 12,000 more than in December, 1913. The result is that its tracks, terminals and other facilities are congested at many places. There are more than 12,000 loaded cars awaiting the discharge of their freight, but the owners of the freight are having some of the same difficulty that the New Haven is having because their own facilities are inadequate in places and cars are not released promptly. To-day, on account of storms and congestion, connecting lines have more than 8,000 loads for delivery, mostly at New York and via the Poughkeepsie bridge, as soon as this company can handle them.

"It is interesting to note that the New Haven, with 4,535 miles of track, including main line running tracks, side tracks and yards, had, during the first eight days of December, 50,677 new loads, while the C. B. & Q. system, extending through ten states, with 12,869 miles of trackage, during the same week had 48,230 cars. These figures indicate how large the New England freight business is. In addition, the passenger train service is much heavier than on a railroad like the C. B. & Q., and makes the problem of furnishing transportation in sufficient quantity and of satisfactory quality under the present unusual and congested conditions that much more difficult.

"For reasons that need not be outlined in this letter, the New Haven has not been able to add materially to its facilities during the last few years, particularly during the last two, when the company has been going through a period of depression, investigation, readjustment and reconstruction of its financial and corporate status. Improvements have been authorized, not including equipment, which are being made as rapidly as men, material and weather will permit, that will cost nearly \$5,000,000. In addition to this, very large sums should be spent, if money can be obtained, for additions to tracks, bridges, terminals, engine facilities and motive power, both steam and electric.

"In spite of financial troubles, the freight equipment of the company is in much better shape than it was a year ago. A

year ago there were 4,800 freight cars in bad order and now there are less than 1,600—a marked improvement, and a number not far from the minimum that may be expected with 46,000 cars on the road. The company has placed orders for 33 powerful freight locomotives to be delivered in January and February, and 500 coal cars which are promised in March, costing about \$1,500,000.

"The company has tried to relieve its rail lines just so far as it could by diverting business to its boat lines, but here again it has not been able to add to its facilities because of the uncertainty surrounding the future of the boat lines. The company considered very seriously placing an order nearly a year ago for two additional freight steamers to run on Long Island Sound, but did not feel that it had the right to borrow the large sum of money necessary, considering the fact that within a comparatively short time the company might be ordered, under the Panama Canal act, to dispose of all of its water lines. The relief, therefore, given by the boats is not as great as the company would like.

"There comes a time when the volume of business that is being done by a man, a steel mill, a hotel, or a railroad is more than the physical ability of the man or the enterprise to carry on successfully, and in such cases the part of prudence is to state the case frankly to customers and patrons and to explain why there is delay in furnishing goods, accommodation or service. It looks to-day as if for the time being the New Haven road can do no more than it is doing, and that it may have to withdraw temporarily from some kinds of business.

"The management of the New Haven earnestly hopes that the result of the efforts now being made on its own road and on its connecting lines will permit the present large volume of business to continue and that it will be necessary to put out so-called "embargoes" and curtail service for only limited periods of time, but it feels that it should state to you the situation that is confronting it at the present time—a condition brought about by causes that are beyond its control. The management will be glad to receive any suggestions from you who represent both the public and the railroads as to steps that can be taken."

FORMAL OPENING OF THE ST. PAUL ELECTRIFICATION

The first engine division of the elctrification section of the Chicago, Milwaukee & St. Paul, consisting of 112 miles and extending from Three Forks to Deer Lodge, was completed by the end of November, 1915. On November 30 the trolley system was energized and on December 1 a train consisting of an electric locomotive and a few business cars was run over the line. During the following week various test runs were made and finally on December 8 an exhibition run was made for the president of the railway, directors and others. This run consisted in hauling over the division a 3,000-ton train, handled by a single electric locomotive on grades under one per cent, and by two electric locomotives on grades over one per cent. The grade through Janney, where the president's party was assembled, is 1.66 per cent.

The electric train was hauled over the grade quietly and easily, and passed the party running at the rate of about 15 to 16 miles an hour. Following behind this train came another of 2,000 tons hauled by two of the company's type "L" steam locomotives with the help of one Mallet pusher. In spite of the fact that this train was only two-thirds as heavy as the first, the three steam locomotives had difficulty in going past the party at the rate of about 10 miles an hour.

It has developed that the 282-ton electric locomotive used by the St. Paul can handle considerably more tonnage than the builders guaranteed, and also that its system of regenerative braking has proved exceptionally successful. In this connection, a preliminary test made over the tracks of the Butte, Anaconda & Pacific may be of interest. On November 13, 1915, one of the first electric locomotives to be shipped hauled a 4,941-ton train

(including the weight of the locomotive) from Rocker to the Anaconda yards without the use of air brakes, except to stop at Durant and Anaconda. The regenerative control was used to hold the train on the one per cent down grades and during this time as much as 880 amperes, or approximately 2,100 k.w. (at 2,400 volts), were returned to the trolley. To determine definitely just what could be done with this method of braking the train was allowed to reach a speed of 25 m.p.h. on the one per cent down grades. When the electric brakes were cut in the speed was reduced to 7 m.p.h. The reduction in speed was accomplished without any perceptible jar to the train with all the braking effort concentrated at the locomotive; the slack between cars was bunched, therefore eliminating all danger of a "breakin-two" from that cause. The tests of this type of electric braking on the Butte, Anaconda & Pacific showed that a train going down grade can return 21 per cent of the electrical energy required to move the same train up the same grade at the same speed.

In cases where an electric locomotive is used as a pusher a run-around track is provided at the top of the grade to enable the pusher to go to the head-end of the train so that it can assist with the electric braking on the down grades without taking the slack out of the train.

All tests of the new electrification have been particularly successful and on December 9 the first passenger train, the St. Paul's crack transcontinental "Olympian" was taken from Butte to Piedmont by an electric locomotive.

SOME PROBLEMS AND PRINCIPLES OF GOV-ERNMENT REGULATION OF RAILROADS*

By Emory R. Johnson

Professor of Transportation and Commerce, University of Pennsylvania

Different policies as regards the ownership and operation of railroads characterize the relation of the government to the railroads in the countries composing the Pan-American Union. In the United States, Uruguay, Paraguay, Bolivia and the Guianas, the policy of complete corporate ownership prevails; in Mexico and Brazil nearly all the railroads are government lines; in Peru, the major share of the railroads belong to the state; in Chile, railroad ownership is about equally divided between the government and the corporations; while in the West Indian and Central American countries and in Colombia, Venezuela and Argentina, the governments own only a small share of the total rail mileage. There are corporation-owned railroads in all countries of the Pan-American Union; and, consequently, each country must concern itself with the government regulation of railroad charges.

The concrete problems connected with railway regulation necessarily vary with different countries. The purpose and the necessity therefor may be fundamentally the same, but the laws to be enacted and the administrative agencies to be created to make regulation effective not only in preventing harmful practices, but also in securing more adequate and efficient railroad facilities will be influenced by the physical, economic and political conditions characteristic of the several countries. No argument is required to prove the need of adapting railroad regulation to the special conditions peculiar to each country, or of legislating in the United States, Brazil and elsewhere with regard to the particular transportation problems of each country. The purpose of this paper is not to consider the provisions of the legislation that any particular country should enact; the object is rather to state some problems common to railroad regulation and some general principles that should control legislative and

As I have stated elsewhere,† the essence of the problem of government regulation of railroads owned and controlled by

*From a paper presented at the Pan-American Scientific Congress, Section IX, at Washington, D. C., on January 3, 1915.

corporations consists of harmonizing, as far as possible, the interests of private corporations of a quasi-public character, engaged for profit in the performance of a service of a public nature, with the interests of the individuals, the localities and the general public served by carriers. The aim sought by the carriers is an increasing business at rates that will yield as large profits as can be obtained without interfering with the growth of traffic; the interests of the public served by the railroads require that the service shall be progressively efficient, that the charges shall be as stable as general business conditions warrant, and shall be neither unreasonably high nor unjustly discriminatory as between persons, places or kinds of traffic.

Such a problem as this must necessarily be a permanent one, because it involves the determination and enforcement of equity. Equity being a matter of relationship varies with changes in the things compared. What is equitable today may not be so tomorrow. A rate that was reasonable five years ago may be unjust at the present time, and a service formerly adequate may have become quite unsatisfactory. Some problems of government can be disposed of by legislation; other problems have to be faced day by day, year in and year out. Railway regulation is a problem that comes within the latter category.

The carriers and the public alike recognize transportation to be a service of a public nature that must needs be so performed as to afford, in as great a degree as possible, justice and fairness of opportunity as between persons and as among places. From whatever angle the long-contested question of the government control of railroads may be viewed by men of different environment and training, all fair-minded men agree as to the necessity of such governmental authority over rail carriers as may be required to minimize unreasonable discriminations in services and charges. Differences of opinion arise, if at all, not as to the necessity for governmental regulation of railroads, but as to the limits that should be placed upon public control.

To succeed in any reform it is necessary not only to proceed by right methods in the right direction, but also to know what limits to give to the movement. It is possibly more harmful to proceed too far than to stop short of the proper goal. These generalizations apply to the government regulation of railroads, as indeed to all legislation intended to better economic and social conditions.

In considering the limitations that should be placed upon railroad regulation, the fact should be kept in mind that, while the occasion that prompts legislation is the elimination and prevention of abuses, the main object of regulation is the attainment of positive, not negative results. As a result of the government's relation to the carriers, the public should be served with better transportation facilities. Regulation should not only prevent the carriers from doing wrong, it should also formulate standards of right conduct, and secure for the public adequate transportation facilities so managed and operated as to render efficient services.

The primary need of the public is for adequate transportation facilities, for a transportation system that develops with the growth of the country, and so completely serves all parts of the country as to permit each section of the national territory to use its natural resources and to employ the skill and energies of its population in profitable production.

The healthy development of railroad transportation facilities, when they are provided by corporations, is conditioned upon the railroad business being an attractive investment for the owners of private capital, and upon the railroad service being one that appeals to men of executive ability. A policy of government inspection, regulation and control that made it difficult for railroad companies to secure capital under favorable conditions, or that caused men ambitious of large success in life to turn to other pursuits than the managing of railroads could not fail, in the long run, to be contrary to the best interests of the public.

In the management of railroads operated by a large number of corporations, co-operation both among connecting and among parallel and rival lines is necessary. Shippers, consignees and

 $[\]dagger$ See American Railway Transportation, ch. xxix, and Elements of Transportation, ch. xxiii.

travelers desire a unified and responsible service by a transportation system that unites all parts of the country and is available to all patrons under like conditions as regards charges and service efficiency.

The theory of the common law of the several states in the United States and of the statute law of the states and of the federal government has been that each railroad company should act independently of its competitors, and that companies owning parallel and rival lines should not be allowed to co-operate or unite in arranging their competitive services or in determining and mantaining their charges for those services. This theory of law is neither in accord with the necessary practice of the railways nor in harmony with the best interests of the public.

While the theory of common and statutory law remains unchanged, both the general public and the responsible government officials recognize the necessity of the co-operation of rival railways in the making of rates, the arrangement of services, and the adjustment of numerous affairs of common interest to the several railways. This co-operation among competing lines is, under the present system of law, necessarily informal, but is possibly as effective as it would be if the law permitted a greater degree of common action. In the future development of railway legislation in the United States the necessity and desirability of railway co-operation should be recognized, and the railroads should be permitted to do openly, subject to government supervision and necessary regulation, what they now do informally and in a large measure secretly.

It is now nearly a half century since railway regulation was begun by the several states of the United States, and nearly a third of a century since the interstate commerce act became a law. The experience of these years has made it clear to everybody that railway regulation, if successful, must start with giving full publicity to the service and to the activities of the companies that perform the service. This, however, is merely preparatory to regulation, which consists in substituting for private standards of business management equitable public standards as regards charges, services, facilities, accounts and finances.

Railway legislation was undertaken in this country, primarily, to regulate charges and prevent discriminations. It has now so developed as to include a large degree of supervision and regulation of the facilities by which the services are performed and of the accounts and practices of railway companies. The financial methods and practices of railways have not yet been subjected to regulation by the United States government. Several of the states, however, have undertaken the supervision of railway financiering, particularly as regards the control of the issues of stocks and bonds.

While railroad regulation in the United States, which at first concerned itself mainly with the prevention of unreasonable charges and unjust discriminations, has broadened into the administrative supervision of the facilities and services of the carriers, the principles of rate-making and regulation are still in process of evolution. During recent years the conviction has been growing that the cost of the service should be given more weight than it has been accorded in the making of rates and in passing judgment upon rates whose reasonableness may be called in question before commissions or courts.

Because of the greater consideration being given to cost, in judging as to the reasonableness of rates and also because of the growing conviction on the part of the public that the financial transactions of railroads should be as free from secrecy and as fully subject to government regulation as are the services, charges and accounts of the carriers, Congress in 1913 directed the Interstate Commerce Commission to perform the difficult and lengthy task of valuing the property of all the railroads in the United States. Several of the states had prepared, or had undertaken, the physical valuation of the railroads within their respective borders. The people of the United States are fully committed to the task of determining the value of railroads and of keeping the valuation up to date by such periodic revisions as may be necessary.

It remains to be seen to what extent the decisions of the Interstate Commerce Commission and of the several state commissions in the United States as to the reasonableness of rates that have been fixed by the carriers shall be determined by giving weight to the cost of the service. During the last decade, rapid progress has been made in railroad accounting, and it is, perhaps, possible that government accountants may be able to determine, with fair accuracy, the cost of transportation for the several classes of freight and for the commodities that move in relatively large volume; although it is not to be expected that it will ever be possible to ascertain closely the cost of transporting each particular article of freight carried by the railroads. On the whole, however, it is probable that cost can be made a workable basis of railroad charges.

Should this be found by experience to be the case, the question will still remain how fully costs ought to be made the basis of railroad charges and to what extent, if any, consideration should be given to the value of the service to shippers and consignees. Economists, commissioners and legislators are still debating this question, and I shall not venture to assert what the ultimate decision will be as to the theoretically just and the most desirable basis of railway charges. As I now view the question, it does not seem to be probable that cost will ever be made the sole basis of railroad charges. It is probable that other factors will be, and ought to be, taken into consideration in determining the reasonableness of the charges of railroad companies.

One reason for believing that this will be the ultimate decision is that cost is a basis more in harmony with charges made in accordance with private business standards than with charges made with reference to the realization of general public and social aims. Unless it be shown, theoretically or by experience, that an adherence to cost as the primary standard of reasonableness of rates will enable the government so to regulate railroads as to promote social ends to a desirable degree, it is not to be expected that cost will be the only factor in deciding what is just or unjust, desirable or undesirable, advantageous or disadvantageous as regards the charges of public carriers.

The one debated step in the regulation of railroads not yet taken in the United States is that of public control of the financial operations of railroads and other public utilities. Measures providing for the supervision and regulation of the stock and bond issues of railway companies engaged in interstate commerce have been before Congress for several years, and there are indications that Congress will, in the near future, require railroad companies to secure the Government's approval of proposed issues of securities. As I have already indicated, such legislation is as much to be desired as was the legislation subjecting the railroad services, charges and accounts to effective governmental control.

In this brief discussion of some of the problems and principles of government regulation of railroads, the experience and needs of the United States rather than of other countries have necessarily been considered. Doubtless, the general principles of railroad regulation applicable in one country are valid in other countries, although practical measures to give effect to these principles may vary widely on account of different political and economic conditions.

Emphasis needs to be laid in all countries upon the administrative character of the problem of governmental regulation of railroads. Success depends upon the adequacy and efficiency of administrative agencies created to enforce legislation. The wisest laws are those that establish general principles and standards and give to the commission or administrative body created to enforce the laws ample discretionary executive powers. The people of the United States were somewhat slow to realize this fact, but the lesson has now been learned, and the federal and state commissions are being given adequate administrative powers.

In considering the relation of the government to the railroads one is necessarily confronted with the broad question whether regulation is to be permanent in some countries and government ownership to prevail in other countries, or whether government ownership will ultimately prevail in all countries. Personally, I do not believe this fundamental question can be determined theoretically or a priori. Each country must work out the problem on the basis of experience and with reference to its own political and economic conditions.

One thing is certain, that no country will find it to be permanently advantageous to have both private and government operation of railroads. The dual system of private railroads and government lines has been shown by the experience of European and other countries to be as impracticable as illogical. Government regulation is theoretically defensible, and, in some countries, has been found to work successfully. Likewise, government ownership and operation have proven satisfactory in a number of countries, but the lesson of experience is that the success of government ownership depends upon the complete nationalization of railroads, and the management of the nationalized system of railroad transportation with reference to the furtherance of clearly defined political and economic ends.

Predictions as to the future are usually of little value, but it seems apparent that private ownership and government regulation of railroads is to prevail in some countries, and that government ownership and operation is to be the permanent policy of other countries. Some states of the Pan-American Union now have private ownership of railroads under government regulation, other states have completely nationalized their railroads, while other countries are experimenting with the policy of partial nationalization. The prediction I venture to make is that ultimately all of the nations of the Pan-American Union will adopt one or the other of the two alternative policies—private railroads under government regulation or complete nationalization of railroads.

FEDERAL IMMIGRATION SERVICE AND THE RAILROADS

By W. L. Stoddard

Washington, January 5, 1916

Ways in which the railroads may co-operate with the Federal Immigration Service, both in the work of distributing newcomers to the United States and in the task of connecting menless jobs with jobless men, are set forth in some detail in the annual report of Commissioner General A. Caminetti, made public here a short time ago. This officer goes so far as to suggest that the government might own suitable cars for the transportation of aliens, but hastens to add that this might prove "impracticable," since the railway lines handling this traffic "would undoubtedly fit up the requisite number of cars in a satisfactory manner and either rent them when required or arrange tariff rates, which will include the extra service required to meet the extraordinary conditions."

Particular reference is here made to the transportation of aliens to be deported for one reason or another from the United States. Owing to the fact that hitherto deportation parties have been carried in tourist cars equipped with commissary facilities, but so arranged that persons of bad character have been brought "into somewhat close contact with less objectionable persons of both sexes," the commissioner general declares that for humanitarian as well as for moral reasons radical changes should be effected. The commissary should be in a different car; there should be sleeping accommodations for the attendants; and the different classes of aliens should be separated as far as possible.

"It may be difficult," states Mr. Caminetti, "to accomplish all that is desired during the existing state of reduced activity of deportations, but it is deemed advisable at this time to call attention to the circumstances and suggest that the bureau be permitted to negotiate for the furnishing of facilities which will be above criticism and insure the maintenance of proper conditions at all times during the transcontinental movement of deportation parties."

The other important recommendation of the commissioner general has already been touched on in this correspondence. It calls for legislation authorizing the Interstate Commerce Commission, in co-operation with the secretary of labor, to make the needed rules and regulations to permit the establishment of employment seekers, excursion, party and other rates required in the development of the department's plans on employment and distribution. Because of the interest of this not only to the railroads, but to the business public, which, together with the railroads, appreciates the necessity of developing an efficient system of federal employment agencies, the commissioner general's remarks on this point are quoted nearly in full:

"The employment and distribution work now progressing favorably will necessarily be localized and fail to attain all of its ultimate purposes unless the railroad companies are permitted to and do make special rates for transportation from the populous centers of the country to the more remote sections and to all places necessary to meet the demands for labor.

"It should be remembered that many applicants for employment are not provided with sufficient funds to defray the expense of reaching the location of proposed employment if the latter is not in the immediate vicinity of the place where they are living; sometimes there is a lack even for short distances. The greatest number of employment seekers is usually found in large cities such as New York, Boston, Philadelphia, Baltimore, Cincinnati, Chicago, St. Louis, New Orleans, San Francisco and Seattle, which are more or less distantly removed from the farms and other enterprises in need of help.

"This condition frequently places upon the would-be employer, and generally upon charitable organizations, the burden of advancing money for transportation and other expenses. The difficulty in solving the problem thus presented is enhanced by the comparatively high cost of rail transportation, and in exact ratio to the reduction of this cost will the solution of the problem be simplified and facilitated.

"The railroad lines of the United States have long since given 'home seekers' and other reduced rates, granting substantial reductions in railroad fares at certain seasons of the year, sometimes throughout the year. Thus have they accommodated those who had funds to defray transportation charges, yet the working man, whose capital consists of his ability to perform manual labor but who is none the less desirable as a passenger and state builder, has somehow been overlooked and thus discouraged from leaving the crowded centers and trying his fortunes in those sections which annually suffer from the want of his labor

"Informal negotiation with the associations which represent most of the principal lines discloses the fact that they are willing to consider the reductions requested if the necessary legislation can be obtained to clothe the Interstate Commerce Commission with authority to permit the railroad lines to make 'employment seekers,' excursion, party and other rates limited to those cases in which the designated representative of the Department of Labor issues a certificate showing that the persons named therein are traveling between the designated points for purposes of employment under the auspices of the Department of Labor in pursuance of an arrangement perfected according to its regulations.

"The effect of this plan would be to give great impetus to the distribution work of the department, extend its sphere of usefulness and enable its plans for co-operation with states, municipalities and private organizations to produce maximum results. It would also operate beneficially for the government, wage earners, employers and transportation companies—the latter through the increased traffic, passenger and freight, that would with the growing success of the movement be the result of increase of production and prosperity in the agricultural sections of the country."

The "requisite legislation" requested by the commissioner general is neither extensive nor expensive. It is one of these propositions, however, which more often than not fall through for the reason that few pay to them the attention they deserve.

Railwan Age Gazette

PUBLISHED EVERY FRIDAY AND DAILY EIGHT TIMES IN JUNE BY THE SIMMONS-BOARDMAN FUBLISHING COMPANY

EDWARD A. SIMMONS, President. HENRY LEE, Sec'v & Treas. L. B. SHERMAN, Vice-President. WOOLWORTH BUILDING, NEW YORK.

CHICAGO: Transportation Bldg. CLEVELAND: Citizens' Bldg. LONDON: Queen Anne's Chambers, Westminster.

EDITORS:

SAMUEL O. DUNN, Editor ROY V. WRIGHT, Managing Editor.

W. E. HOOPER H. H. SIMMONS A. C. LOUDON C. W. Foss C. B. Peck W. S. Lacher F. W. KRAEGER H. F. LANE E. T. Howson R. E. THAYER G. L. LACHER K. R. HARE

Entered at the Post Office at New York, N. Y., as mail matter of the

Subscriptions, including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free: United States and Mexico, \$5.00; Canada \$6.00; Foreign Countries (excepting daily editions), \$8.00; single copies, 15 cents each.

\$8.00; single copies, 15 cents each.

Engineering and Maintenance of Way Edition and four Maintenance of Way Convention daily issues, North America, \$1; foreign, \$2.

WE GUARANTEE that of this issue 8,900 copies were printed; that of these 8,900 copies 7,328 were mailed to regular paid subscribers to the weekly edition, 145 were provided for counter and news companies' sales, 1,072 were mailed to advertisers, exchanges and correspondents, and 355 were provided for new subscriptions, samples, copies lost in the mail and office use; that the total copies printed this year to date were 8,900, an average of 8,900 copies a week.

The RAILWAY AGE GAZETTE and all other Simmons-Boardman publications are members of the Audit Bureau of Circulations.

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General News Department

It is announced in Montana that on the Great Northern Railway meals are now served in dining cars at 75 cents each.

The management of the Wabash has reached an agreement with its yardmen, providing for increases in pay effective on January 1, at some of the smaller yards on the system.

A delegation representing, according to newspaper despatches, "nearly all the farmers of Des Moines county, Iowa," called on J. F. Deems, formerly general superintendent of motive power of the New York Central Lines, at his farm in Des Moines county, last week, and presented a petition asking him to become a candidate for governor of the state.

The Baltimore & Ohio has announced that its relief department, an organization of many years standing, providing insurance and sick benefits for employees, will continue in operation, in the State of Pennsylvania, the same as heretofore; and that the company will take no action under the new workmen's compensation act of that State. The benefits paid by the B. & O. relief department, the fund of which is supported mainly by assessments on the employees, are said to be about the same in amount as those provided for by the new Pennsylvania law.

The entire Pennsylvania Railroad System, 26,000 miles of track, has completed two years without a single one of the 361,572,114 passengers carried in that period being killed in a train accident. (The number of persons carried in November and December was estimated.) The lines east of Pittsburgh have completed their third successive year without a single fatality of this class.

General Manager S. C. Long, in a New Year's greeting to employees, congratulates them on this freedom from accident, and "You have made a record for safe railroading, which, I believe, has never been equalled; and in this great honor every employee shares.'

Wood Preservers' Convention

The twelfth annual convention of the American Wood Preservers' Association will be held at the Hotel Sherman, Chicago, on January 18, 19 and 20. In addition to the reports of committees and the individual papers announced in the issue of December 17, J. W. Kendrick, consulting engineer and formerly vice-president of the Atchison, Topeka & Santa Fe, will speak on Tuesday morning, January 18. The annual banquet will be held at the Hotel Sherman on Wednesday evening, January 19. Professor F. H. Newell, University of Illinois, and formerly chief engineer of the United States Reclamation Service, will be the speaker of the evening.

Education in Railroading

The School of Commerce of New York University, Washington Square, New York City, now has running a course of lectures on railroad organization and management, under the direction of Professor Edwin J. Clapp. Some of the lectures are given by officers of the New York Central.

Columbia University, New York City, anounces that beginning next autumn the university will establish a School of Business, with three-year courses, leading to degrees. Candidates for admission must have had two years in college or an equivalent preparation. Provision will be made for evening classes. Transportation is one item in a long list of subjects to be taught.

Western Society of Engineers

The fifty-sixth annual dinner of the Western Society of Engineers will be held at the Hotel Sherman, Chicago, on Wednesday evening, January 12, at seven o'clock. The principal speaker will be Samuel Insull, president of the Commonwealth Edison Company, Chicago.

National Americanization Committee

The National Americanization Committee is to hold a national conference on immigration and Americanization at Philadelphia on January 19-20. The subjects discussed will include labor supply and distribution and the possible effects of after-war conditions on immigration conditions. There are six railroad men members of the National Americanization Committee, as follows: Frank Trumbull, chairman of the executive committee (chairman of the C. & O. and M., K. & T.); Howard Elliott (president of the New Haven), C. H. Markham (president of the Illinois Central), Samuel Rea (president of the Pennsylvania), William H. Truesdale (president of the D., L. & W.), and William Sproule (president of the Southern Pacific).

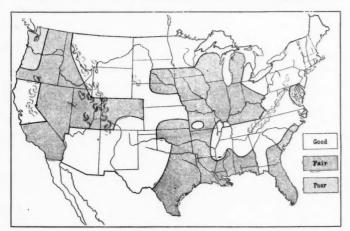
Western Railway Club

At the December meeting of the Western Railway Club it was announced that hereafter the regular monthly meeting will be held in the Grand Pacific hotel, Chicago, the third Tuesday evening in every month except June, July and August. Arrangements have also been made for those who remain in town for the meeting to have their dinner at the hotel in a special room that will be reserved for the club members. This will present a good opportunity for a general get-together meeting before the paper of the evening is presented. It was also announced that a light luncheon will be served after the meeting, and in order not to make the meetings unduly late, the speaker will be introduced promptly at 8 o'clock and the discussion will be closed at 9:30.

Outlook for Business in 1916

The accompanying map is reproduced from the special bulletin issued by the Chamber of Commerce of the United States of America. The basis of this bulletin is a special report as of December 11, made by the Committee on Statistics and Standards. In connection with the map this bulletin says:

The outlook for business for the first four months of 1916 is in striking contrast to that prevailing this time last year, as will be evident from a comparison of the accompanying charts.



Business Conditions in December

There are spots where much caution and conservatism yet remain, and the influence of high prices for the future further accentuates this caution because dealers feel that high prices will curtail buying by the consumer. There are other sections where the apprehension caused by the European war still hangs on. Broadly speaking and in a general way it may be said that the

spirit of optimism and hopefulness prevails to a degree that has not been apparent for nearly a decade, and the general belief and expectation is for such prosperity during 1916 as will recompense the people of this country for all their past misfortunes.

Investigation of New York Public Service Commission

Robert C. Wood, of New York, in resigning his place as public service commissioner (as announced under another head), wrote a letter to the governor, declaring utterly baseless and false the statements that have been made before the Thompson committee, investigating the relations of Mr. Wood to the signal manufacturers, in which it was said that he was willing to receive a bribe; but, feeling that the use made of this testimony, as published, will impair his opportunity of serving the state efficiently, he believed it right to resign.

On December 30, W. W. Salmon, president of the General Railway Signal Company, appeared before the Thompson committee and answered questions relating to the contract, awarded to that company, for installing the signal apparatus in the Fourth avenue subway, Brooklyn, in connection with which contract the committee had heard that a large fund had been raised for improper uses. This suspicion appears to have been based mainly on an expenditure of \$50,000 by Mr. Salmon's company; but he produced vouchers to show that this sum had been appropriated (and most of it had been paid) for the acquisition of the Simmen speed control patents.

Valuation Progress

In a statement prepared by Thomas W. Hulme, general secretary of the Presidents' Conference Committee for the federal valuation of the railroads, the statement is made that the consideration of unit prices by the Cost Data Bureau of the Division of Valuation of the Interestate Commerce Commission will permit of the application of prices in February, 1916, to the properties of the Texas Midland, the Kansas City Southern, the Atlanta, Birmingham & Atlantic, the Norfolk Southern the Elgin, Joliet & Eastern, and the San Pedro, Los Angeles & Salt Lake. It is the intention of the director of valuation that the carriers shall be afforded an opportunity to discuss these prices with the local government representatives before the district member of the engineering board sends the inventory to Washington, following which an oportunity will be afforded the carriers' organization and the representatives of the states to consider the inventory and to offer other suggestions in connection therewith.

On November 30, 1915, a total of 41,607 miles of line had been inventoried by the government forces, with reference to road and track, 25,640; with reference to bridges, 24,291; for buildings, 21,042 for signals and 43,367 for telegraph and telephone property. A total of 12,660 miles of line has also been examined by the government forces for the determination of land values.

Atlantic City Exhibits

The Railway Supply Manufacturers' Association has seen out an official circular relating to the exhibits at Atlantic City during the Master Car Builders' and American Railway Master Mechanics' convention which will be held June 14-21, 1916, in which it designates Friday, February 18, as the time at which assignments of space will be made. So many inquiries about space were received because of a preliminary circular which was sent out about a month ago that it is advisable for those who have exhibited in previous years and who expect to exhibit next June, to make immediate application to J. D. Conway, secretarytreasurer, Oliver Building, Pittsburgh, Pa. A number of improvements are to be made on the Million Dollar Pier, which will add to the exhibit space and also contribute to the convenience of the exhibitors. Aquarium Court will be rearranged, the spaces on the south side being extended 3 ft. out into the aisle and the aisleways on both sides being roofed over. The decorations in the main building at the entrance to the pier will be entirely new and even more attractive than in former years. No dividing rails will be permitted in Machinery Hall and its extension and the floors will be thoroughly cleaned and oiled. New matting will be used throughout this building as well as in all the other sections of the exhibit space. More or less trouble has been experienced in the past because of insufficient power. Arrangements have been made to insure an ample supply for the coming conventions. Applications for space will be considered in the order

of their receipt and should be forwarded to Secretary Conway

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, date of next or regular meetings and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass. Next convention, May 2-5, 1916, Atlanta, Ga.

American Association of Demurrace Officers.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, January, 1916, At-

American Association of Dining Car Superintendents.—H. C. Boardman, D. L. & W., Hoboken, N. J.

man, D. L. & W., Hoboken, N. J.

American Association of Freight Agents.—R. O. Wells, Illinois Central, East St. Louis, Ill. Next meeting, June 20-23, 1916, Cincinnati, O. American Association of Passenger Traffic Officers.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York.

American Association of Railroad Superintendents.—E. H. Harman, Room 101, Union Station, St. Louis, Mo.

American Electric Railway Association.—E. B. Burritt, 8 W. 40th St., New York. Mid-year meeting, February 4, 1916, Congress Hotel, Chicago.

Chicago.

American Electric Railway Manufacturers' Association.—H. G. McConnaughy, 165 Broadway, New York.

American Railroad Master Tinners', Coppersmiths' and Pipefitters' Association.—W. E. Jones, C. & N. W., 3814 Fulton St., Chicago.

American Railway Association.—J. F. Fairbanks, general secretary, 75 Church St., New York.

American Railway Bridge and Bullding Association.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 17-19, 1916, New Orleans, La.

La.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 21-23, 1916, Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, 1112
Karpen Building, Chicago. Annual meeting, June 19, 1916, Atlantic City, N. J.

American Railway Master Mechanics' Association.—J. W. Taylor, 1112
Karpen Building, Chicago. Annual meeting, June 19, 1916, Atlantic City, N. J.

American Railway Tool Foremen's Association.—Owen D. Kinsey, Illinois Central, Chicago. Annual meeting July, 1916.

American Society for Testing Materials.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

American Society of Civil Engineers.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

American Society of Mechanical Engineers.—Calvin W. Rice, 29 W. 39th St., New York.

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American Wood Preservers' Association.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 18-20, 1916, Chicago.

Association of American Railway Accounting Officers.—E. R. Woodson, Rooms 1116-8, Woodward Bldg., Washington, D. C. Annual meeting, June 28, 1916. Hotel Statler, Detroit, Mich.

Association of Manufacturers of Chilled Car Wifeels.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association. Annual convention, October, 1916, Chicago.

Association of Railway Claim Agents.—Willis H. Failing, N. Y. C., 3842 Grand Central Terminal, New York. Next meeting, May 19, 1916, Atlantic City, N. J.

Association of Railway Electrical Engineers.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago.

Association of Railway Telegraph Superintendents.—P. W. Drew; Soo Line, 112 West Adams St., Chicago. Annual meeting, June 20-22, 1916, St. Paul, Minn.

Association of Railway Engineers.—Superintendents.—P. W. Drew; Soo Line, 112 West Adams St., Chicago. Annual meeting, June 20-22, 1916, St. Paul, Minn.

Association of Railway Clue.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular mee

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Traffic Manager, R. F. & P., Richmond, Va. Annual session, May 17, 1916, Washington, D. C.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

Chicago.

International Railway Fuel Association.—C. G. Hall, C. & E. I., 922
McCormick Bldg., Chicago. Annual meeting, May, 1916, Chicago.

International Railway General Foremen's Association.—Wm. Hall,
1126 W. Broadway, Winona, Minn. Annual meeting, July, 1916.

International Railroad Master Blacksmiths' Association.—A. L. Woodworth, C. H. & D., Lima, Ohio. Next meeting, August, 1916, Chicago.

Maintenance of Way and Master Painters' Association of the United States and Canada.—T. I. Goodwin, C. R. I. & P., Eldon, Mo.

Master Boiler Makers' Association.—Harry D. Vought, 95 Liberty St.,
New York. Annual convention, May 23-26, 1916, Hotel Hollenden,
Cleveland, Ohio.

Master Can and Locomotive Painters' Association of the United States and Canada.—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 12-14, 1916, Wilmington, Del.

Master Car Builders' Association.—J. W. Taylor, 1112 Karpen Building, Chicago. Annual meeting, June 14, 1916, Atlantic City, N. J. NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 349 People's Gas Bldg., Chicago. Next convention, March 21-23, 1916, Chicago. New England Ralimoad Clube.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

New York Ralikoad Clube.—Harry D. Vought, 95 Liberty St., New York, Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

Niagara Frontier Car Men's Association.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

Peoria Association of Railroad Officers.—M. W. Rotchford, 410 Masouic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

Railroad Club of Kansas City.—Claude Manlove, 1008 Walnut St., Kan-

Jenerson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILROAD MEN'S IMPROVEMENT SOCIETY.—J. B. Curran, Erie R. R., 50 Church St., New York. Meetings, alternate Thursdays, October to May, Assembly Rooms of Merchants' Association, Woolworth Bldg., New York.

RAILWAY BUSINESS ASSOCIATION. Front M. N.

New York.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York. Annual meeting, January 27, 1916, Waldorf-Astoria Hotel, New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, 1063 Monadnock Block, Chicago. Meetings with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. R. Edwards. Fire Inc. Act.

way Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Fire Ins. Agt., Mobile & Ohio, Mobile, Ala., October 3-5, 1916, New York.

RAILWAY FRAL ESTATE ASSOCIATION.—Frank C. Irvine, 1125 Pennsylvania Station, Pittsburgh, Pa. Annual meeting, October, 1916, Chicago.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September, 1916, Grand Hotel, Mackinac Island, Mich.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, N. Y. C. R. R., Box C. Collingwood, Ohio. Annual meeting May, 1916.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders' and Master Mechanics' Associations.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph Superintendents.

RICHMOND RAILROAD CLUE.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

Roadmasters' and Maintenance of Way Association.—L. C. Ryan, C. & N. W., Sterling, Ill. Next annual convention, September 19-22, 1916, New York.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

Salt Lake City. Utah. Regular meetings, 1st Saturday of each month, Salt Lake City. Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

Signal Appliance Association.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

Society of Railway Financial Officers.—Carl Nyquist, C. R. I. & P., 1134 La Salle St. Sta., Chicago.

Southern Association of Car Service Officers.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga. Next meeting, April, 1916.

Southern & Southwestern Railway Club.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

Toledo Transforation Club.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

Track Supply Association.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

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Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of Newark.—Roy S. Bushy, Firemen's Bldg., Newark, N. J. Regular meetings, 1st Monday in month, except July and August, The Washington, 559 Broad St., Newark.

Traffic Club of New York.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

Traffic Club of Pittsburgh.—D. L. Wells, Gen'l Agt., Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings, bi-monthly, Pittsburgh.

Traffic Club of St. Louis.—A. F. Versen, Mercantile Library Bldg., St. Louis, Mo. Annual meeting in November. Noonday meetings, October to May.

Train Despatchers' Association of America.—J. F. Mackie. 7122 Stewart

October to May.

Train Despatchers' Association of America.—J. F. Mackie, 7122 Stewart

Ave., Chicago. Next convention, June 21, 1916, Toronto, Ont.

Transportation Club of Detroit.—W. R. Hurley, Superintendent's office,
N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

Traveling Engineers' Association.—W. O. Thompson, N. Y. C. R. R., East Buffalo, N. Y. Next meeting, September, 1916, Chicago.

Utah Society of Engineers.—Frank W. Moore 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

Western Canada Railway Club.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, 1112 Karpen Building, Chicago. Regular meetings, 3d Tuesday in month, except June, July and August Karpen Bldg., Chicago.

Western Society of Engineers.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

The New York, New Haven & Hartford announces that the Federal Express, the through night train between Boston and Washington over the Poughkeepsie bridge, will be discontinued January 9.

In the United States District Court at Pittsburgh, Pa., December 29, the Pittsburgh, Cincinnati, Chicago & St. Louis was fined \$7,800 for violation of the 28-hour law relating to giving rest and feed to animals in transit.

It is announced that a number of Seattle shipping men are organizing a company to build and operate three steamships for service between Seattle and Hawaii, Australia and New Zealand ports. R. M. Calkins, traffic manager of the Chicago, Milwaukee & St. Paul at Seattle, is said to be interested in the plan.

The Inland Navigation Company, preparing to go into the business of freight transportation on the Mississippi river, has made a contract with the Marconi Wireless Telegraph Company for the installation of radio telegraph apparatus on 36 freight barges. These bargers are rated at 1,400 tons, are 240 ft. in length, and are propelled by four engines of 80 h.p. each, working four separate propellers.

The Trunk Lines and Central Traffic Association roads have put in effect new live stock rates, based on valuation. The maximum liability assumed by the carriers at the minimum rate is \$250 for a horse, \$150 for bulls and steers, \$100 for a cow, \$25 for calves and hogs, and \$10 for sheep, lambs and goats. If a higher valuation than these is given, the rate will be increased 5 per cent for every 50 per cent increase in value.

The Boston & Albany announces that with the completion, next June, of the 25 steel passenger cars recently ordered from the Osgood Bradley Car Company, the road will have enough steel coaches to equip all of its main line trains. With steel Pullman parlor and sleeping cars, solid steel trains will then be the rule. Wooden cars will be used in trains on the branches and in suburban service. The coaches in this latest order will be 70 ft. long over end sills, will weigh 143,000 lb., and will seat 84 persons.

The traffic department of the Chicago, Indianapolis & Louisville has issued a circular letter to agents and shippers appealing to all concerned for their efforts toward relieving the possibility of a serious car shortage. The letter says in part: "Not only will the prompt handling and prompt release of equipment prevent loss of revenue, but it will enable the carriers to handle more freight in the same period of time, which will result in profit to carriers as well as profit to shippers and receivers of freight."

Following the complete suspension of traffic through the Panama Canal for slightly over three months on account of slides, the channel was opened sufficiently to allow the passage of six light draft vessels on December 20, and it was intended to pass other waiting vessels as soon as possible. The Canal Record says that no prediction can yet be made of the probable date of opening, and it is desired to avoid a premature resumption of routing vessels through the canal, which would delay the opening of a permanent channel.

At the annual meeting of the Transportation Club of Indianapolis, Ind., held on December 22, the following officers were elected: President, William Thorn, commercial agent, Vandalia; first vice-president, J. L. Keath, commission merchant; second vice-president, C. R. Lewis, division freight agent, Cleveland, Cincinnati, Chicago & St. Louis; third vice-president, A. E. Kalter, secretary, Rauh & Sons Fertilizer Company; secretary L. E. Stone, commercial agent, Central State Despatch.

The Erie, the Lehigh Valley, the Lackawanna and other roads, which advanced passenger fares to points in New York State because of the recently announced advances by the New York Central—which, however, were suspended by the New York State Commission—have put their new tariffs in effect; this apparently with the expectation that the suspension of the New York Central rates by the State will be of short duration. Typical of the

advances are those in the fare from New York City to Syracuse, which is increased from \$6.06 to \$6.54, and from New York to Rochester, advanced from \$7 to \$7.42.

The National Automobile Chamber of Commerce has compiled a booklet listing the automobile-carrying cars of the railroads of the United States as of December, 1915, as a ready reference and to facilitate the return of these cars to the home rails and to automobile manufacturing territory. The list gives the car numbers, the dimensions and the dimensions of end and side doors. Copies of the booklet have been distributed widely among railroad officers with a letter signed by J. S. Marvin, general traffic manager of the association, expressing the hope that every railroad in the country will make an effort to see that automobile equipment is at once put into the service for which it is intended. In the year 1914, he says, approximately 144,000 carloads of automobiles were shipped. In the year 1915 the total will exceed 200,000 carloads, and the shipments of recent months are running double the shipments of a year ago. "Location statements indicate," he says, "that automobile cars are widely scattered and the lines on which this heavy shipping originates are meeting with difficulty in keeping the factories supplied. It is apparent that a supervision even more strict than heretofore must be maintained over this equipment to handle the increased output; and we earnestly urge that any of these cars now on your line, or that come to you be at once returned to owners or sent into the automobile manufacturing territory.'

The Freight Congestion

The trunk lines special committee gave out at New York this week the following statement:

"A general review of the situation discloses that there has been no material change in the total number of cars on track or at terminals of certain roads; but others have felt some relief, as indicated by modification of their embargoes.

"It has developed that a great deal of delay is experienced by all roads owing to the detention of lighters and barges alongside of ocean vessels. One instance of this condition is known where some 70 lighters or barges within the last day or two were awaiting turn at the ships of one line. It also has been found that certain steamship lines have over-contracted their space, engagements running into future months.

"Where freight so contracted is started from western points the railroads are compelled to hold the cars, awaiting convenience of steamships. The railroads feel that unless some relief can be had from these conditions it may be found necessary to embargo shipments consigned for delivery to particular ocean lines."

Embargoes on freight requiring to be lightered in New York harbor are continued, with very little modification. The Pennsylvania now accepts freight for all points in New England. The Lackawanna has embargoed shipments of automobiles, in boxes, both domestic and export. The Central of New Jersey accepts domestic and coastwise freight, except shipments destined for the Bush docks, Brooklyn. The Lehigh Valley refuses all freight consigned to piers in Brooklyn. The Baltimore & Ohio refuses lumber, staves and hay, both domestic and export. The New York Central refuses all freight, both carload and L. C. L., requiring to be lightered at New York, except livestock and meat. The Boston & Albany is refusing at Albany all freight except livestock, perishable goods, foodstuffs and coal. Boston & Maine has issued a similar notice. The Western Maryland is refusing all grain ofr export, its elevators at Baltimore being now filled with about 2,000,000 bushels of grain awaiting vessels. Receipts of grain at the Western primary markets last week amounted to over 30 million bushels, the greatest movement ever recorded; and the pressure of eastbound shipments at all points continues unabated. Embargoes against sending export grain to Philadelphia and Newport News have been lifted. The New York, New Haven & Hartford, trying to borrow locomotives to relieve the freight congestion on its lines, has made inquiries everywhere east of the Mississippi and north of the Potomac rivers, but has not been able to get more than a half dozen engines.

IMPROVEMENTS AT EUSTON STATION IN LONDON.— A further stage in the improvements at Euston station has been reached by the opening of the new dining rooms, which are situated where the west booking hall used to be. The pictures in the panels show early scenes on the London & North-Western,

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has suspended tariffs proposing advances in rates on coal from West Virginia to points in Ohio, Michigan and Indiana.

The Interstate Commerce Commission is to make a general investigation of the subject of bills of lading, particularly with reference to the effect of the Cummins law, making carriers liable for the full value of freight lost in transportation; and hearings will be held, beginning January 24, in New York, Chicago, San Francisco, New Orleans and Atlanta.

New freight tariffs from Northern and Central States to the . Southeastern States, making extensive changes to bring rates within the rule of the fourth section, went into effect on January 1. These changes, made in accordance with orders issued by the Interstate Commerce Commission many months ago, have been objected to by shippers and consignees in all of the principal cities affected by the changes; but it appears that none of the objections have been sufficient to change the views of the commission. In Atlanta mercantile interests have already held conferences to see what they can do to continue their contest to secure disapproval of these advances in rates.

The Wisconsin Freight Relief Association and a number of traffic associations in that part of Wisconsin located in Western Classification territory, have filed a complaint with the Interstate Commerce Commission against what it calls the arbitrary and unreasonable methods used by railroads in constructing class rates to and from the interior part of the state to and from the East. The complaint says "these complainants pray for joint through class rates in proportion to distances and service, and in harmony with their location; that these joint through class rates shall be less than the sums of these local or intermediate rates, and that these joint class rates shall apply in both directions in every case, and that the proportions of the rates on Central Freight Association traffic shall not be greater in any case than the amounts assessed west of the 100 per cent basing points on Eastern Trunk Line traffic."

Complaint Dismissed

Globe Grain & Milling Company v. Atchison, Topeka & Santa Fe et al. Opinion by Commissioner Clements:

The denial at California milling points and the granting at Ogden, Utah; Albuquerque and Belen, N. M.; El Paso, Tex., and points east thereof, of transit arrangements on grain shipped from Kansas, Nebraska, Colorado, Oklahoma and Texas, the products of which are distributed in California is found not to be prejudicial to California millers. (36 C. C., 662.)

J. H. Criswell v. Wichita Falls & Northwestern et al. Opinion by the commission:

The camplainant desired to ship cattle from Gate, Okla., a station on the Wichita Falls & Northwestern, to Kansas City, Mo. Through the negligence of the carrier's agent at Gate in permitting previous shipments of infected cattle, made by another shipper, to be handled through the stock pens at Gate, thereby making it unsafe for complainant to ship through these pens, complainant drove his cattle to Laverne, Okla., for shipment. Laverne also is a station on the Wichita Falls & Northwestern, but a higher rates applies from Laverne than from Gate. The commission dismisses the complaint in as much as it finds no violation of the act to regulate commerce. (37 I. C. C., 97.)

Lumber Rates to Eastern Cities

Opinion by Commissioner Meyer:

The commission finds that the carriers have justified proposed increased rates on lumber of all kinds from points on the Tremont & Gulf, the Louisiana & Arkansas, and other lines of railway in Louisiana and Arkansas to Baltimore, Philadelphia, New York, Boston, and other Eastern destinations taking the same rates. It holds that these increased rates will correct a substantial inequality between mills on the Tremont & Gulf and Louisiana & Arkansas mills, and also between mills on the lines of all the

respondents and of the Rock Island, Iron Mountain and other railways in the Southwest. The proposed readjustment will also make applicable the same rate on pine as on other kinds of lumber. By comparison with rates on similar commodittes between other points, the proposed rates do not appear unreasonable. (37 I. C. C., 212.)

Increased Rates on Peaches

In re peaches from Missouri points. Opinion by Commissioner Hall:

The commission holds that the carriers have justified proposed increased rates on peaches in carloads from the Koshkonong-Brandsville district in southern Missouri and northern Arkansas to Eastern destinations. (37 I. C. C., 89.)

STATE COMMISSIONS

State Commission Opposes Passenger Fare Advance

Representatives of the state railroad commissions of Iowa, Nebraska, North Dakota, Minnesota and Kansas held a meeting at Omaha, Neb., last week to discuss the Interstate Commerce Commission's decision allowing increases in interstate passenger fares, and at the close of the meeting issued the following statement: "It was the sense of the meeting that the decision of the Interstate Commerce Commission in the western passenger advance rate case, in its general applications and the bases followed by the commission in reaching its conclusions, are subject to serious legal objections, and that the various states should resist the order of the commission increasing passenger fares throughout the West, provided methods of review in court exist." The advisability of an appeal to the United States Supreme Court is to be considered.

Santa Fe Ordered to Restore Abandoned Line

On complaint of a number of business organizations in San Diego and neighboring cities, the California Railroad Commission has ordered the Atchison, Topeka & Santa Fe to reconstruct and operate that portion of its line, now abandoned, running from Temecula, in Riverside county, to Fallbrook, in San Diego county, or to construct an alternative line for the purpose of connecting Oceanside and Temecula, via Rainbow valley. order requires the road to file plans and estimates for the line within 90 days and to complete it for operation within a year. In 1880 certain citizens of San Diego and vicinity made large grants of money and land valued at the time from \$4,000,000 to \$5,000,000, and now valued at a much higher sum, to a syndicate which agreed to build a direct line of railroad from the Bay of San Diego to a connection with a transcontinental line. A line to the Temecula canyon was built by a company which has since been acquired by the Sante Fe, which, the commission says, has become the recipient of at least a considerable portion of the The line was in operation for a number of years, but the line through the canyon was finally abandoned, after repeated washouts which, according to the defendant, kept maintenance costs at such a high figure as to make it practically impossible to operate. The complainants contended that the abandonment of the line has worked considerable hardship to jobbers and others at San Diego and throughout the district traversed, and they have been endeavoring to have the line reconstructed ever since it was abandoned. The railroad opposed the complaint, contending that the commission was without jurisdiction; that the prospective traffic would not justify the necessary expenditure, and denied the allegations regarding the need for the road. The commission in its decision did not find that the moral or legal obligations resulting from a contract between the citizens and the original syndicate were of necessity a deciding factor in the case, but that the population of the territory affected has suffered a great injury by reason of the abandonment of the line, and that the re-establishment of direct connections between San Diego and Temecula, either by way of the canyon or by the alternative line, "is a public necessity, which will greatly benefit all of the country affected by the railroad."

The chief engineer of the commission estimated that the cost of the line between Temecula and Oceanside through the canyon would amount to \$344,918; while the chief engineer of the Santa Fe Coast Lines estimated the cost at \$657,498. The commission's engineering department estimated the cost of the alternative line at \$823,000.

PERSONNEL OF COMMISSIONS

The governor of New York has appointed Henry W. Hodge as a member of the Public Service Commission, First district, in place of Robert C. Wood, resigned. Mr. Hodge is a wellknown civil engineer, senior member of the firm of Boller, Hodge & Baird, New York City. He began as an assistant to Alfred P. Boller in 1895, and became a partner in the firm in 1899. This firm has designed many important bridges and other structures, among which are the Duluth and Superior bridge, the cantilevers across the Monongahela and Ohio rivers at Pittsburgh and Steubenville for the Wabash Railway, the Municipal Bridge across the Mississippi river for the city of St. Louis, the bridges across the Connecticut river at Hartford, Saybrook and East Haddam for the state of Connecticut, and the Singer Building, the Metropolitan Tower and other large structures in New York City. Mr. Hodge was retained by the Canadian Government as consulting engineer on the new design for the Quebec Bridge. He is a member of the Council of the American Institute of Consulting Engineers, a director of the American Society of Civil Engineers, a trustee of Rensselaer Polytechnic Institute, and a director of Princeton Theological Seminary.

COURT NEWS

Lackawanna Acquitted

The suit in the United States District Court at Buffalo, reported last week, page 1258, in which the government charged that the low price paid by the Delaware, Lackawanna & Western Coal Company, for the use of coal trestles at Buffalo, amounted to an illegal rebate on the rates for the transportation of coal over the Delaware, Lackawanna & Western Railroad, was prosecuted against both the railroad company and the coal company; and both were acquitted.

State Statutes and Interstate Shipments

In an action for the value of flax lost in transit the Minnesota Supreme Court holds that the Minnesota statute requiring every shipper of grain to place a tag in each car shipped, showing the quantity therein, has no application to shipments originating in another state; nor has the state statute imposing a penalty for failure to settle claims within a certain time.—Farmers' Elevator Co. v. Great Northern (Minn.), 154 N. W., 954.

Fencing-Yard Limits

In an action for the value of a cow killed by a train within yard limits at a point within 150 feet of an established station, between a side track and the main line and between the switch and the station, the Colorado Supreme Court holds that, under the state fencing law of 1911, a railroad need not fence its yards at an established station, even though the limits of the yards are not marked by signs or otherwise. The statute makes no such requirement.—D. & R. G. v. Bird (Colo.), 152 Pac., 911.

Injury to Horse-Proximate Cause

Several horses got on to a track through a defect in the fence, and were frightened by a train and crossed a trestle. After the train had passed, one of them attempted to recross the trestle and fell into the stream and had to be killed. The Texas Court of Civil Appeals holds that the railroad was not liable for its death, the injury not having resulted in direct sequence from any negligence of the company in the construction of the fence or trestle, but to the unusual and not to be anticipated act of the horse in attempting to cross the trestle.— M., K. & T. v. Lovell (Tex.) 179 S. W. 1111.

Recovery of Undercharge

A person who had obtained from a railroad a contract to transport an interstate shipment at a rate less than tariff, on being sued for the undercharge, contended that the contract being illegal the railroad could not recover. The Oklahoma Supreme Court, however, held that the action was not on the illegal contract, but on the contract made by the law. In any event, if the court should hold that recovery could not be had, the object of the Interstate Commerce Act, to prevent rebating,

would be frustrated.—Atchison, T. & S. F. v. Ehret (Okla.), 152 Pac., 1107.

Sale of Road-Liability for Torts of Vendor

In an action against a railroad company for damages to the plaintiff's land caused by the diversion of a river course, it appeared that the defendant was a purchaser of the road from the company that built it, that the diversion was caused by materials blown into the stream by the building company in blasting its roadbed along a cliff, and that the roadbed itself, as purchased and maintained by the defendant, did not encroach on the stream. The Washington Supreme Court held that the defendant was not liable, since the injury was caused solely by the past act of the defendant's vendor.—Backman v. Oregon-Washington R. & N. Co. (Wash.), 152 Pac., 700.

Kansas Liquor Act Held Constitutional

In a prosecution against the Missouri Pacific for violations of the Kansas Mahin Act, the information in twelve counts charged the unlawful bringing of intoxicating liquors into the state for the purpose of delivering it to persons interested therein who intended to use it in violation of the prohibitory law, the defendant knowing such intention; the next twelve counts charged deliveries to such persons, and the twenty-fifth count charged both bringing and deliveries. The Kansas Supreme Court held the act to be constitutional and complementary to the Webb-Kenyon Act. Each count was held to charge a separate offense, and it was error to exclude evidence as to the counts charging deliveries.— State v. Missouri Pacific (Kan.), 152 Pac., 777.

Damages to Brakeman for Permanent Injuries to Leg

The Kentucky Court of Appeals holds that an award of \$9,500 in favor of a brakeman, 22 years of age, who was earning \$105 a month, for an injury, caused by the giving way of a handhold on top of a freight car, resulting in the forcing of the femur into the hip joint, so that the leg became shortened and permanently stiffened, and causing him great pain down to the time of the trial, is not excessive, in view of the fact that the jury on a former trial of the case awarded him \$10,000. There was no evidence of any contributory negligence to cause a reduction of the damages under the federal employers' liability act.—C. N. O. & T. P. v. Nolan (Ky.) 179 S. W. 1046.

Res Ipsa Loquitur Maxim

A railroad station employee sued for injuries sustained when burning rubbish in the station furnace by the alleged explosion of a torpedo, causing flame to dart from the door and injure his eyes. He invoked the legal maxim, res ipsa loquitur, which means that the thing speaks for itself, or is a short way of saying that the circumstances attendant on an accident are, of themselves, of such a character as to justify a jury in inferring negligence as the cause of that accident. The Texas Court of Civil Appeals held that the maxim did not apply, since, if it were proved that there was a torpedo in the furnace, the plaintiff was still under the necessity of showing that the railroad's negligence caused it to be there.—Galveston, H. & S. A. v. Chojnacky (Tex.), 180 S. W., 141.

Injury to Passenger-Evidence

A conductor took possession of a passenger's suitcase and its contents on her refusal to pay the fare demanded for a child of her sister traveling with her. The passenger, in an action for special damage, pleaded that the conductor used insulting language to her when he took the suitcase, which caused her shame and humiliation, and also caused her to suffer mental anguish, pain, and sickness. At the trial she failed to prove that the conductor used any insulting language, but was permitted to testify that, on account of being deprived of some medicine in the suitcase, which she was taking for her health, she became sick and was confined to bed for four weeks. The Oklahoma Supreme Court held that this was error. The evidence must be confined to the issues raised by the pleadings. Judgment for the plaintiff was reversed.—Chicago, R. I. & P. v. Mailes (Okla.), 152 Pac., 1131.

Railway Officers

Executive, Financial, Legal and Accounting

George P. Furber, assistant counsel of the Boston & Albany at Boston, Mass., has been appointed claims attorney and W. L. Parsons has been appointed assistant counsel.

George H. Fernald, Jr., assistant counsel of the Boston & Albany, at Boston, Mass., has been appointed counsel, vice Woodward Hudson, resigned, and on January 1 became chief of

the legal department of the Boston & Albany. Mr. Fernald was born on August 3, 1882, at Worcester, Mass., and is the son of George H. Fernald, of Worcester, who has been connected with the Boston & Albany for nearly 30 years. The subject of this sketch was educated in the grammar and high schools of his native town, also at Worcester Academy, from which he was graduated in 1899. In 1903 he graduated from Harvard College with the degree of A.B., and from Harvard Law School in the class of 1905 with the degree of LL.B. In 1904 he was admitted to the bar and



G. H. Fernald, Jr.

then was in general practice for two years with the firm of Hallowell & Hammond. On July 1, 1907, he entered the service of the Boston & Albany in the law department as assistant counsel, and now becomes counsel of the same road, as above noted.

A. A. Tisdale, superintendent of the Grand Trunk Pacific at Regina, Sask., has been appointed assistant to the vice-president and general manager and purchasing agent, vice George W. Caye, resigned to accept service with another company.

H. A. Worcester, who has been appointed vice-president and general manager of the Cleveland, Cincinnati, Chicago & St. Louis, with office at Cincinnati, Ohio, was born on November 18,

1862, at Albany, N. Y. He is a graduate of Yale University, and entered railway service in De-cember, 1885, as assistant stationmaster of the New York Central & Hudson River at the Grand Central station, New York City. August, 1891, he went to Buffalo, N. Y., where he did clerical work for the Lake Shore & Michigan Southern. A year later he was appointed assistant trainmaster of the Franklin division, and in February, 1893, was promoted to superintendent of the Lansing division. He was transferred to superintendency of the Detroit division in June, 1896, where he re-



H. A. Worceste

mained until November, 1902, when he was appointed superintendent of the Eastern division. In February, 1905, he became superintendent of the Western division, but remained in that

position only three months, at the expiration of which time he entered the service of the Michigan Central as assistant general superintendent. In November of the same year he was promoted to the general superintendency. In February, 1906, he returned to the Lake Shore as general superintendent, and in the following October was appointed assistant general manager of the Cleveland, Cincinnati, Chicago & St. Louis, with office at Cincinnati. He was appointed general manager of this road on July 10, 1913, and continued in that position up to the time of his recent appointment to the vice-presidency.

C. J. Chenworth, engineer of roadway, second district of the Atlantic Coast Line at Savannah, Ga., has been appointed assistant to third vice-president with office at Wilmington, N. C., vice C. M. James, appointed engineer of construction, effective January 1.

John K. Large, chief special agent of the Central of New Jersey, after a service of more than thirty years, has retired from active service at his own request and the office of chief special agent has been abolished. Willis H. Failing has been appointed claims attorney, with headquarters at Jersey City, N. J. He will have general charge of claims for personal injuries and for loss and damage to property, except those within the jurisdiction of the traffic department. Mr. Failing resigned on October 1 as assistant chief claim agent of the New York Central after a service of over 20 years with that road.

Arthur E. Sweet, whose election as vice-president of the Denver & Rio Grande has been announced, was born at Pascoag, R. I., on October 26, 1865. He was educated at Wichita,

Kan., leaving school in November, 1881. He first entered railway service in July, 1883, as a messenger in the office of the superintendent of the Atchison, Topeka & Santa Fe, at Las Vegas, N. M. He remained there in various capacities until 1885, when he was appointed timekeeper in the trainmaster's office in the same city. From 1889 to 1893 he was clerk, assistant chief clerk and chief clerk to the superintendent, at San Marcial, N. M., and El Paso, Tex. From 1893 to 1894 he was chief clerk to the superintendent of the same railroad at Colorado Springs, Colo. In 1894 he went



A. E. Sweet

to Topeka, Kan., and remained there until 1897 as transportation clerk in the office of the general superintendent. From 1897 to 1900 he was chief clerk to the assistant general superintendent in the same city. His next position was that of trainmaster of the Missouri division at Marceline, Mo., where he remained from February 1, 1900, to July 1, 1902. On the latter date he was transferred in the same capacity to the New Mexico division, with headquarters at Las Vegas, N. M. On July 5, 1902, he was appointed assistant to the general manager at Topeka, Kan., and remained there until August 1, 1905, when he left the Santa Fe to become general manager of the Arkansas Southern, with office at Ruston, La. On February 1, 1906, he came to Chicago, Ill., to become assistant to the second vice-president of the Chicago, Rock Island & Pacific. He was promoted to general superintendent of the Southwestern district, with office at Topeka, Kan., on April 1, 1907, and continued in this position until December 2, 1909, when he returned to Chicago, to become assistant to the president. On February 1, 1911, he was appointed general manager of the Second district, with office at Topeka, Kan. He held this position up to the time of his recent election as an executive officer of the Denver & Rio Grande.

A. R. Marshall, assistant auditor of the Minneapolis, St. Paul & Sault Sainte Marie, at Minneapolis, Minn., has been appointed

assistant comptroller. B. E. McCune has been appointed auditor of disbursements; B. Newhouse has been appointed auditor of traffic accounts, and R. Brownlee, freight auditor, has been appointed assistant auditor.

Operating

J. M. Parker has been appointed general manager of the Arkansas & Louisiana Midland, with office at Crossett, Ark.

A. E. Lock, car accountant of the Toronto, Hamilton & Buffalo, has been promoted to superintendent of car service, with office at Hamilton, Ont.

A. B. Apperson, general superintendent of the Utah lines of the Denver & Rio Grande at Salt Lake City, Utah, has resigned, effective January 8.

Keith Randolph has been appointed trainmaster of the Lehigh & New England with office at Pen Argyle, Pa., vice W. E. Baily, assigned to other duties.

R. L. Mock has been appointed assistant superintendent, and in addition, will assume the duties of chief clerk, of the Atlanta Joint Terminals at Atlanta, Ga., owned by the Louisville & Nashville, the Atlanta & West Point and the Georgia Railroad.

H. C. Woodbridge, special representative of the general manager of the Buffalo, Rochester & Pittsburgh, has been promoted to assistant to the general manager. His duties will be principally with the mechanical department. J. W. James, special representative of the general manager, has been promoted to assistant to general manager, with duties in the transportation department. Both have headquarters at Rochester, N. Y.

Homer Edgar McGee, whose appointment as superintendent of the Shreveport district of the Missouri, Kansas & Texas has been announced, was born at Alvord, Tex., on October 15, 1885. He was educated in the common schools and entered railway service on March 1, 1906, as a station helper for the Missouri, Kansas & Texas at Holland, Tex. He was subsequently employed as operator, cashier, relief agent and agent at various places. In 1908 he went to Smithville, Tex., as car distributor in the despatcher's office. In 1909 he was promoted to despatcher, and in 1910 was appointed chief train despatcher. He was appointed trainmaster of the Smithville district in 1912, and remained in that position until his recent appointment to the superintendency of the Shreveport district.

Charles H. Smith, whose appointment as superintendent of the Green Bay & Western, the Kewaunee, Green Bay & Western and the Ahnapee & Western has been announced, was born at Green Bay, Wis., on June 5, 1867. He received a high school education, and entered railway service on June 15, 1886. as a brakeman on the Milwaukee Northern, now a division of the Chicago, Milwaukee & St. Paul. He was first employed by the Green Bay & Western as a brakeman on September 3, 1888. On August 30, 1889, he was promoted to freight conductor, and on November 15, 1902, was promoted to passenger conductor. On November 20, 1911, he was appointed trainmaster, and on January 1, 1916, superintendent of the three affiliated roads mentioned above. His headquarters will be at Green Bay, Wis.

D. N. Bacot, who has been appointed superintendent of the East Carolina division of the Seaboard Air Line with head-quarters at Charleston, S. C., as has already been announced in these columns, entered the service of the Seaboard Air Line on April 1, 1899, as a clerk to V. E. McBee, general superintendent at Portsmouth, Va. He subsequently served as clerk, stenographer and traveling secretary to Mr. McBee until January, 1901. He was then chief clerk to division superintendent at Savannah until September, 1905, when he was appointed superintendent of the Savannah & Statesboro Railway, with head-quarters at Statesboro and remained in that position until December, 1913. He then served as trainmaster on the Alabama division of the Seaboard Air Line at Americus, Ga., until December 1, 1915, when he was appointed superintendent of the same road, as above noted.

H. F. Houghton, general superintendent of the Cleveland, Cincinnati, Chicago & St. Louis, with office at Indianapolis, Ind., has been appointed general agent, operating department, with office at Cincinnati, Ohio. E. M. Costin, assistant general superintendent at Indianapolis, Ind., has been appointed general superintendent, with office at the same city. B. C. Byers, superintendent

of the St. Louis division, with office at Mattoon, Ill., has been appointed assistant general superintendent, with headquarters at Indianapolis, Ind. C. S. Millard, superintendent of the Peoria division, with office at Indianapolis, has been transferred to the St. Louis division, vice Mr. Byers. T. J. Hayes, superintendent of the Michigan division, with office at Wabash, Ind., has been transferred to the Peoria division, vice Mr. Millard. P. T. White, superintendent of terminals at Cleveland, Ohio, has been appointed superintendent of the Michigan division, vice Mr. Hayes.

W. H. Averell, general superintendent of the Wheeling district of the Baltimore & Ohio, at Wheeling, W. Va., has been appointed general manager in charge of the New York properties, and J. F. Keegan, superintendent of the Chicago division, at Garrett, Ind., succeeds Mr. Averell. J. H. Jackson, superintendent of the Newark division, at Newark, Ohio, has been transferred to the Chicago division. D. F. Stevens, assistant superintendent of the Monongah division, at Grafton, W. Va., has been appointed superintendent of the Newark division, and Hugh Wilson, of the general manager's staff at Baltimore, Md., succeeds Mr. Stevens. W. T. Lechlider has resigned as superintendent of the Cleveland division at Cleveland, Ohio, to become vice-president and general manager of the River Terminal Railroad, of Cleveland, and has been succeeded by H. B. Green, transferred from the Wheeling division. J. W. Root, assistant superintendent at Wheeling, has been promoted to superintendent of that division. Effective January 1.

John B. Dickson, who has been appointed general manager of the Erie lines west, with headquarters at Cleveland, Ohio, was born in Steubenville, Ohio, and entered railway service in



J. B. Dickson

1881 in the maintenance of way department of the Cleveland and Pittsburgh division of the Pennsylvania Lines West of Pittsburgh. From April, 1887, to February, 1893, he was supervisor of the same division, and from 1893 to January 1, 1902, was roadmaster on the Galena division of the Chicago & North Western. From the latter date to January, 1903, he was assistant engineer maintenance of way on the Baltimore & Ohio; from January, 1903, to June, 1905, he was engineer maintenance of way for the same road. In June, 1905, he became chief engineer maintenance of

way, and subsequently left the Baltimore & Ohio to become assistant to the general manager of the Erie, and later superintendent of the Rochester division of the same railroad. On July 1, 1909, he was appointed general agent of the operating department of the Erie at Chicago, Ill., and in January, 1913, was appointed superintendent of the New York division, with office at Jersey City, N. J. On January 1, 1914, he was promoted to assistant general manager of the Ohio grand division, and in June, 1915, was appointed assistant general superintendent of Lines West of Buffalo and Salamanca, with office at Cleveland, Ohio, which position he held up to the time of his recent

Traffic

Y. J. Shelton has been appointed traffic manager of the Arkansas & Louisiana Midland, with office at Crossett, Ark.

J. B. Dunlap has been appointed commercial agent of the Gulf, Florida & Alabama, with headquarters at Pensacola, Fla.

Lewis T. Tune has been appointed general agent of the Fort Smith & Western, and the St. Louis, El Reno & Western, with office at St. Louis, Mo.

P. L. Shepherd has been appointed assistant general freight

and passenger agent of the Gulf & Ship Island with headquarters at Gulfport, Miss.

Robert L. McKibbin, general baggage agent of the Sunset-Central Lines at Houston, Tex., has been appointed general mail agent for the Texas and Louisiana lines, with office at Houston. He will also continue as general baggage agent.

Edgar M. Westervelt, whose appointment as land and industrial commissioner of the Chicago, Burlington & Quincy, lines west of the Missouri river, has been announced, was born at Buda, Ill.,

on May 17, 1861. He was educated in the common and high schools. In 1878 he entered the service of the Burlington as a telegrapher on lines in Illinois. On December 5, 1884, he became attached to the right of way department of the same road during the construction of the line from Aurora, Neb., to Grand Island, and later was promoted to assistant right of way agent. In December, 1901, he was appointed head of the department for lines west of the Missouri river. In 1909 the name of the department was changed to real estate department, and in 1910 he was appointed assistant real es-



E. M. Westervel

tate and industrial commissioner, his jurisdiction having been extended over industries. In December, 1915, the land and industrial department was created and Mr. Westervelt was appointed land and industrial commissioner for western lines, with office at Lincoln, Neb.

F. A. Curry, division freight agent, and L. E. Oliphant, chief of tariff bureau, of the Lake Erie & Western the Fort Wayne, Cincinnati & Louisville and the Northern Ohio at Indianapolis, Ind., have been promoted to assistant general freight agents, and their former offices have been abolished.

George W. Davis, general freight agent of the Vandalia at St. Louis, Mo., retired under the pension rules on January 1. Charles B. Sudborough, assistant general freight agent, has been appointed general freight agent, vice Mr. Davis. B. H. Dally, division freight agent at St. Louis, has been appointed assistant general freight agent, vice Mr. Sudborough, promoted.

L. B. Burford, general agent of the traffic department of the Erie at Baltimore, Md., has been appointed assistant to the general traffic manager, with office at New York. G. R. G. Smith has been appointed general agent of the traffic department at Baltimore, succeeding Mr. Burford, and F. D. Austin has been appointed special agent of the traffic department at New York.

T. J. Anderson, general passenger agent of the Sunset-Central Lines at Houston, Tex., has retired from service, and has been succeeded by J. H. R. Parsons. Joseph Hellen, assistant general passenger agent, with office at the same city, has been appointed general passenger agent of Morgan's Louisiana & Texas Railroad & Steamship Company, with office at New Orleans, La.

E. D. Hotchkiss, general freight agent of the Chesapeake & Ohio and the Chesapeake & Ohio of Indiana, at Richmond, Va., has been appointed freight traffic manager, with headquarters at Richmond. Thornton Lewis, general western freight agent, at Cincinnati, Ohio, has been appointed assistant freight traffic manager, with headquarters at Cincinnati, and A. P. Gilbert, assistant general freight agent at Richmond, has been appointed general freight agent, with headquarters at Richmond.

R. M. Dozier, commercial agent at Memphis, Tenn., for the Missouri Pacific-St. Louis, Iron Mountain & Southern, has been appointed assistant general freight agent, with office at Omaha, Neb., vice A. R. Malcolm, transferred. G. B. Chipley, chief clerk to H. M. Adams, general traffic manager, has been appointed

general agent of the freight department at Memphis, Tenn., vice Mr. Dozier. R. S. Fine, traveling freight agent, has been appointed acting general agent of the passenger and freight departments at Philadelphia, Pa. T. F. Lawrence has been appointed district passenger and freight agent at Nashville, Tenn., an office just created. E. A. Morris, traveling freight agent at Ft. Worth, Tex., has been promoted to district passenger and freight agent, with office at that city.

W. V. Lifsey, who has been appointed assistant general passenger agent of the New York Central at New York, began railway work as a stenographer in the office of the assistant general passenger agent of the Southern Railway at Atlanta, Ga. Shortly afterward he became private secretary to the passenger traffic manager at Knoxville, Tenn., and later entered the service of the Plant System as division passenger agent at Savannah, Ga. He was subsequently transferred to Tampa, Fla., then to Havana, Cuba, and later to Montgomery, Ala. On March 1, 1907, he was appointed chief clerk to the general eastern passenger agent of the New York Central Lines at New York. He was later made assistant general eastern passenger agent of the New York Central. On February 1, 1911, he was promoted to general eastern passenger agent, and now becomes assistant general passenger agent of the same road, as above noted.

Clarence Crombie Howard, who has been appointed assistant general passenger agent of the New York Central lines east of Buffalo, and the West Shore Railroad, with headquarters at

Grand Central Terminal, New York City, was born on June 8, 1873, in New York City. He began railway work in September, 1887, as a messenger in the office of the traffic manager of the New York City & Northern, now the Putnam division of the New York Central. He was then consecutively extra ticket agent, operator, traveling auditor, city ticket agent and train despatcher on that road until 1897, when it was leased to the New York Central. In 1897 he entered the passenger rate department of the New York Central as stenographer. On August 1, 1899, he was promoted



C. C. Howard

to rate clerk, and in October, 1906, to chief rate clerk. He was appointed chief clerk of the passenger department on May 1, 1907, which position he held until his promotion to assistant general passenger agent, as above noted. Mr. Howard succeeds W. R. Barnet, resigned to go into other business.

H. Bertermann, general agent for the Cleveland, Cincinnati, Chicago & St. Louis at Columbus, Ohio, has been appointed assistant general passenger agent, with office at Cincinnati, Ohio, succeeding F. H. Wipper. Mr. Wipper has been appointed general agent, passenger department, with office at Cincinnati, succeeding E. R. Whelen, promoted. S. N. Behenna, traveling passenger agent at Atlanta, Ga., has been appointed general eastern passenger agent at New York City. C. Krotzenberger, traveling passenger agent, with office at Huntington, W. Va., has been appointed general agent, passenger department, at Columbus, Ohio, succeeding H. Bertermann, promoted. E. E. Smith, general agent, passenger department, Louisville, Ky., has been transferred in the same capacity to Cleveland, Ohio. G. P. Porter has been appointed general agent, passenger department, at Louisville, Ky., succeeding E. E. Smith. C. B. Munyan has been appointed general agent, passenger department, at Toledo, Ohio. T. Stephens, traveling passenger agent, with office at Sandusky, Ohio, has been appointed division passenger agent at Van Wert, Ohio. Paul A. Platz has been appointed manager of the advertising department, with office at Cincinnati, Ohio. Appointments effective January 1.

The Missouri Pacific and St. Louis, Iron Mountain & Southern, which have maintained joint traffic agencies in different parts of the country in conjunction with the Denver & Rio Grande and the Western Pacific, have established separate agencies of their own. The following appointments as general agents of the passenger and freight departments have been announced: J. R. Duckworth, Denver, Colo., transferred from Pueblo, Colo.; B. E. Sells, Pueblo, Colo., transferred from Joplin, Mo.; J. J. Kavanaugh, Salt Lake City, Utah, and H. R. Bingham, Los Angeles, Cal. F. E. Walling, traveling freight agent at Grand Junction, Colo., has been appointed district passenger and freight agent at the same place. A. R. Malcolm, assistant general freight agent at Omaha, Neb., has been appointed general agent of the passenger and freight departments at San Francisco, Cal. W. M. Cook, representing the Western Pacific at San Francisco, has been appointed general agent of the passenger and freight departments of the Missouri Pacific-Iron Mountain at Portland, Ore. E. D. Lamiman, traveling freight agent at Tacoma, Wash., has been promoted to general agent of the passenger and freight departments at the same city, and W. S. Mitchell, commercial agent at Seattle, Wash., has been appointed general agent of the passenger and freight departments at that city.

Harry Parry, who has been appointed assistant general passenger agent of the New York Central and the West Shore, with headquarters at Buffalo, N. Y., began railway work in 1883



H. Parry

as a messenger in the traffic manager's office of the Great Western Railway at Hamilton, Ont. The following year he became stenographer in the rate department, and then served in the freight claims department until the consolidation of that road with the Grand Trunk. From January to April, 1885, he was stenographer in the freight claims department of the Grand Trunk at Montreal, Que., and then to September of the same year was stenographer to the general freight and passenger agent on the Northern & North Western at Toronto, Ont. He then served as clerk to

the general agent in the passenger department and assistant city passenger and ticket agent on the West Shore at Buffalo, N. Y., until December, 1885, when he took a similar position with the New York Central & Hudson River under consolidation arrangement. On May 27, 1889, he was appointed city passenger and ticket agent of the New York Central and West Shore at Buffalo, N. Y., and since March 1, 1897, was general agent of the passenger department of the same lines at Buffalo, N. Y.

Engineering and Rolling Stock

- W. J. Murrian has been appointed general foreman of the Southern Railway at Winston-Salem, N. C., succeeding T. S. Inge, deceased.
- E. B. Hillegass, assistant engineer of the Atlantic Coast Line, at Rocky Mount, N. C., has been appointed engineer of roadway, with office at Savannah, Ga., vice C. J. Chenworth, promoted.
- H. C. May, superintendent of motive power for the Chicago, Indianapolis & Louisville, has been appointed to the same position on the Lehigh Valley, with office at South Bethlehem, Pa.
- A. F. Blaess, engineer maintenance of way of the Illinois Central, with office at Chicago, Ill., will report hereafter directly to the general manager instead of to the chief engineer. Effective January 1.
- F. F. Gaines, superintendent of motive power of the Central of Georgia at Savannah, Ga., has been granted leave of absence on account of ill health, and W. H. Fetner, master mechanic at Macon, Ga., has been temporarily appointed general

master mechanic, in charge of the mechanical department, with headquarters at Savannah, effective January 1.

- E. R. Lewis, assistant to the general manager of the Duluth, South Shore & Atlantic at Duluth, Minn., has had his jurisdiction extended over all matters pertaining to engineering, maintenance of way and structures, and federal valuation.
- C. P. Burgman, master mechanic of the Chicago, Indianapolis & Louisville at Bloomington, Ind., has been appointed superintendent of motive power, with office at Lafayette, Ind., vice H. C. May, resigned to accept service with the Lehigh Valley. John Neary, general foreman of the car department at Lafayette, Ind., has been appointed master car builder. R. Rohrabaugh, roadmaster at Bloomington, Ind., has been appointed general roadmaster. W. H. Strang, road foreman of engines at Lafayette, Ind., has been appointed general road foreman of engines, with headquarters at the same city. P. L. McManus, general superintendent of the Chicago, Indianapolis & Louisville, with office at Lafayette, Ind., has had his jurisdiction extended over the mechanical department in addition to the roadway and transportation departments.

Purchasing

George W. Caye, assistant to vice-president, and general manager and purchasing agent of the Grand Trunk Pacific at Winnipeg, Man., has been appointed general purchasing agent of the Grand Trunk with office at Montreal, Que., vice J. H. Guess, resigned.

Special Officers

F. A. Greene, whose appointment as assistant superintendent of the insurance department of the Pennsylvania System has already been announced in these columns, was born on March



F. A. Greene

14, 1878, at Philadelphia, Pa. He was educated at Friends' Central School of that city and at the University of Pennsylvania. Mr. Greene entered the service of the Railroad Pennsylvania on May 1, 1899, as a clerk in the office of the auditor of passenger traffic, and served in that position until April 15, 1903. During the summers of 1899 and 1900 he was assigned to duties in the ticket receiver's office at Atlantic City, N. J. In April, 1903 he was transferred to the insurance department, and on January 1, 1904, was appointed inspector. On July 1, 1909, he was promoted to chief inspector

of the insurance department, in which position he has had charge of the inspection work from an insurance standpoint of all the property of the Pennsylvania System.

OBITUARY

- J. W. Hogsett, chief joint car inspector for all railroads entering and leaving Ft. Worth, Tex., died in his office on December 24.
- W. D. Mann, formerly assistant general ticket and passenger agent of the Chicago, Kansas & Nebraska, with office at Topeka, Kans., died at Berkeley, Cal., on December 25, 1915. He had left railroad service 25 years ago.

THE NEW STRATEGIC RAILWAY TO EGYPT.—The construction is reported of a new strategic railway from the Hedjaz Railway (described in the *Railway Age Gazette* of July 30, 1915), to the Egyptian frontier. The line is 100 miles long and is being extended, according to reports, into the heart of the Sinai Peningula.

Equipment and Supplies

CARS AND LOCOMOTIVES ORDERED IN 1915

Since the publication of the annual car and locomotive statistics in last week's issue, pages 1240 to 1246, there have come to our attention additional orders for 1,996 freight cars, 9 passenger cars and 39 locomotives. These added to the totals reported in last week's issue increase the figures for equipment ordered during the year to the following amounts: Freight cars, 109,792; passenger cars, 3,101, and locomotives, 1,612.

A number of the orders in question were placed earlier in the year and came to our attention in reports received from the railways or builders too late for insertion last week. The remainder are new orders placed in the last three days of the year. A detailed list follows:

	FREIGI	HT CARS	
Purchaser	No.	Kind.	Builder
Canadian Govt. Rys		Box80,000	
Chesapeake & Ohio	1000	Coal	Pressed Steel
Lake Terminal	30	Hop. bodies	Pressed Steel
Lehigh & New England.	200	Gondola	Pressed Steel
monitor of areas and	550	Hopper	Pressed Steel
Mineral Range		Rock	Am. C. & F.
Randolph-MacDonald Co.		Dump	National Steel
Tucson, Cornelia & Gila			
Bend	2	Tank6,000g.	GerAm.
areas a volume a volu	4	Flat100,000	McGuire Cum.
		Box100,000	
U. S. Navy		Tank	Ger. Am.

^{*} This was reported in last week's issue as 250 gondola cars.

DASSENCED CARS

Purchaser	No. Kind	Builder
Edmonton, Dunvegan & B. C	No. Kind 2 Gasolene m e	ch. McKeen
Interurban Transportation	2 Gasolene me	ch. McKeen
Ocean Shore	1 Gasolene m e	
Pacific Ry. & Nav. Co	1 Gasolene m e	
Union Pacific	3 Gasolene m e	

LOCOMOTIVES

No.	Cylinders	Weight	Туре	Builder
25				Canadian
1	20x28	189,000	4-6-0	American
6	24x32	222,000	2-8-0	American
1	20x26	146,000	0-6-0	American
1			0-6-0	Baldwin
1			E'tric	West-McG Cum.
2			0-6-0	Baldwin
1			0-6-0	Baldwin
1			0-6-0	Baldwin
	25 1	1 20x28 6 24x32	No. Cylinders Weight 25 1 20x28 189,000 6 24x32 222,000 1 20x26 146,000	No. Cylinders Weight Type 25 1 20x28 189,000 4-6-0 6 24x32 222,000 2-8-0 1 20x26 146,000 0-6-0 1 E'tric 2 0-6-0 1 0-6-0

LOCOMOTIVES

THE CHARLOTTE HARBOR & NORTHERN is inquiring for one tenwheel switching locomotive.

THE NEW YORK CENTRAL has ordered 5 Mallet type locomotives from the American Locomotive Company.

THE INDIANA HARBOR BELT has ordered 20 Mikado and 10 switching locomotives from the American Locomotive Company.

THE CHICAGO, WEST PULLMAN & SOUTHERN has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works.

THE MINE HILL COMPANY, Saginaw, Mich., has ordered 2 sixwheel switching locomotives from the Baldwin Locomotive Works.

THE PITTSBURGH STEEL COMPANY, Pittsbrugh, Pa., has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works.

The Newport News Ship-building & Dry Dock Company has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works.

THE LACLEDE GAS LIGHT COMPANY, St. Louis, Mo., has ordered one six-wheel switching locomotive from the American Locomotive Company. This locomotive will have 18 by 24-in. cylinders, 50-in. driving wheels and a total weight in working order of 106,000 lb.

THE CHICAGO HEIGHTS TERMINAL TRANSFER RAILROAD has ordered one six-wheel switching locomotive from the American Locomotive Company. This locomotive will have 20 by 26-in. cylinders, 50-inch driving wheels and a total weight in working order of 146,000 lb.

The Delaware, Lackawanna & Western, reported in the Railway Age Gazette of December 24 as having issued inquiries for 10 Mikado and 7 Pacific type locomotives, has ordered these locomotives from the American Locomotive Company. The engines will be equipped with superheaters and Baker valve gear, and will be used in freight service.

The Canadian Government Railways have ordered 15 Consolidation and 10 Pacific type locomotives from the Canadian Locomotive Company, Ltd. The Consolidation locomotives will have 24 by 32-in. cylinders, and a total weight in working order of 232,000 lb. The Pacific type engines will have 23½ by 28 in. cylinders, and a weight in working order of 230,000 lb.

THE CENTRAL VERMONT has ordered one ten-wheel and 6 Consolidation locomotives from the American Locomotive Company. The ten-wheel locomotive will have 20 by 28-in. cylinders, 69-in. driving wheels and a total weight in working order of 189,000 lb. The Consolidation locomotives will have 24 by 32-in. cylinders, 57-in. driving wheels and a total weight in working order of 222,000 lb.

FREIGHT CARS

The American Steel & Wire Company is inquiring for 30 gondola cars.

THE ATLANTIC REFINING COMPANY is reported in the market for 15 tank cars.

THE HERCULES POWDER COMPANY is in the market for 8 50-ton tank cars.

The Bethlehem Steel Corporation is inquiring for prices on 100 gondola cars.

The Pittsburgh Steel Company is reported as having issued inquiries for 40 50-ton ore cars.

THE ERIE is inquiring for prices on 500 to 1,000 drop-end gondola cars and 500 to 1,000 40-ton box cars.

THE MISSOURI, KANSAS & TEXAS has ordered 1,500 gondola cars from the American Car & Foundry Company.

THE UNITED STATES ALUMINUM COMPANY is reported to have ordered 12 40-ft. flat cars from the Standard Steel Car Company.

THE UNION TANK LINE is in the market for 36 40-ton 10,000-gal. capacity tank cars, 17 pairs of trucks for 30-ton cars and 21 pairs of trucks for 40-ton cars.

FRENCH GOVERNMENT.—It is reported that the French Government has ordered 5,000 freight cars from the Standard Steel Car Company, and 2,000 from the Canadian Car & Foundry

The Lehigh & New England, reported in the issue of December 10 as being in the market for 550 hopper and 200 flat cars, has ordered 550 50-ton steel hopper cars and 200 50-ton composite drop-end gondola cars from the Pressed Steel Car Company. These cars will be equipped with the Carmer uncoupling device, Buffalo brake beams, Westinghouse air-brakes, Farlow twinspring draft gear, Gould bolsters and Gould journal boxes. Simplex couplers will be used on the gondola cars and Sharon couplers on the hopper cars.

PASSENGER CARS

THE CHESAPEAKE & OHIO, reported in the Railway Age Gazette of December 10 and December 31 as being in the market for 12 express cars, 6 coaches and 2 chair cars, has ordered these cars from the Pullman Company.

NATIONAL RAILWAYS OF MEXICO. The report in last week's issue to the effect that this company had placed an order for passenger cars with the Pullman Company has been denied. It is further reported also that no order has been placed for Pullman service.

Supply Trade News

H. E. Walker, for several years New York representative of the S. K. F. Ball Bearing Company, Hartford, Conn., has severed his connection with that company.

The Burd High Compression Ring Company has sent out a booklet announcing the completion of a new factory, tastily illustrated with photographs of the new structure.

The Q. & C. Company, New York, announces that it has purchased the National Railway Materials Company, and that henceforth the business of the latter will be done in the name of the Q. & C. Company.

B. H. Forsyth, who for the past three years has been connected with the sales department of the Hale & Kilburn Company, with office at Chicago, and formerly sales manager of the Ford & Johnson Company, resigned, effective January 1.

Hal C. Bellville, secretary to President Howard, of the Commonwealth Steel Company, has been appointed assistant to the president of the company, effective January 1: Mr. Bellville entered the employ of the company about 10 years ago as a clerk and stenographer and has been secretary to the president for about five years.

Edward F. Carry, Chicago, as noted in last week's issue, has been elected president of the reorganized Haskell & Barker Car Company, of Michigan City, Ind. Mr. Carry was born in Ft.



E. F. Carry

Wayne, Ind., on May 16, 1867, and was educated in the public schools of that city. He began his business career with the Wells & French Car Company, Chicago, and was secretary of this company at the time of its consolidation with the American Car & Foundry Company. He has served the latter company for 28 years as district manager, third vice - president, second vice-president and later as first vice - president and general manager. Since 1903 he has been a director and member of the executive committee of the company. Mr. Carry's election as president of the Haskell &

Barker Car Company was effective on January 1; he will take office on January 10, upon the completion of legal details. The following directors of the Haskell & Barker Car Company have been elected: Frank A. Vanderlip, president of the National City Bank; W. E. Corey, president of the Midvale Steel & Ordnance Corporation; Ambrose Monell, president of the International Nickel Company; Joseph W. Harriman, president of the Harriman National Bank; John Morron, president of the Atlas Portland Cement Company; E. S. Webster, Stone & Webster; A. O. Choate, Potter, Choate & Prentice; and Edward F. Carry. Two additional directors will be chosen later on. Mr. Carry has a large circle of friends among railway officers throughout the country. His home is in Chicago, with summer residence at Lake Forest, Ill.

Thomas McDonald, general superintendent of the Carnegie Steel Company for the Youngstown district since January 1, 1907, has been made advisory manager, effective January 1. He has been succeeded by James H. Grose, for the last four years superintendent of the Ohio works. I. Lamont Hughes has been appointed assistant general superintendent. A. W. Griffith, who has acted as assistant to Mr. Hughes, has been promoted to the position of general superintendent of bar mills in the Youngstown district, and Harry Baugh has been made assistant general superintendent of bar mills.

E. V. Babcock has been elected a director of the Cambria Steel Company to succeed E. B. Morris, who recently resigned. Arthur E. Newbold has been elected chairman of the executive committee to succeed Mr. Morris, and Powell Stackhouse has also been elected a director.

A. E. Meggs, New York manager of the L. S. Starrett Manufacturing Company, Athol, Mass., has resigned from that position to enter the sales department of Flint & Chester, Inc., New York. Mr. Meggs has been associated with the L. S. Starrett Manufacturing Company for 14 years.

Charles H. Sharp, vice-president of the Sharp & Fellows Contracting Company, Los Angeles, Cal., died in that city on December 22, 1915, at the age of 56 years. Mr. Sharp had been engaged in the construction of railways in practically every section of the country and in various parts of Canada for many years. As a young man he went west from Washington, D. C., and in a few years established himself at Kansas City, Mo., as a railroad contractor. Some six years ago work on the Pacific coast caused him to change his headquarters to Los Angeles, where he joined with C. A. Fellows in organizing the Sharp & Fellows Contracting Company. This company built the Cajon cut-off across the mountains east of San Bernardino, Cal., for the Atchison, Topeka & Santa Fe., and has been constructing the line of San Diego & Arizona through the mountains east of San Diego, Cal.

Cambria Steel Awards at San Francisco

For its exhibit at the Panama-Pacific International Exposition in San Francisco the Cambria Steel Company received awards as follows: In the department of manufacture, a silver medal for panels of field and poultry fence; in the department of transportation, a medal of honor for railway supplies and a gold medal for automobile accessories, bars and special shapes; in the department of agriculture, a gold medal for an exhibit of agricultural tools and parts of agricultural machines. The company's exhibit was contained in a space of about 25 by 50 ft. Of special interest to railway men were the following exhibits: a table display of railroad track accessories, including 100 per cent rail joints, a reinforced angle bar rail joint, Morrison guard rail and tie sections and test pieces of Cambria steel; pedestal displays of rails, I-beams, axles, etc.; a stand with car axles, a piston and a special axle bent cold 360 deg. One exhibit showed a pair of standard car axles twisted cold around each other like the strands of a rope. The company also exhibited the Kelly steel converter used at the Cambria Iron Works in 1861 and 1862; this is understood to be the first converter in America.

To Further Chinese Trade

The banking firm of Gaston, Williams & Wigmore, Inc., with principal offices at 140 Broadway, New York, and branches in England, France, Russia, Spain, Portugal, Italy, Cuba and South Africa is about to start a campaign for the development of a broader market for American goods throughout China and the Far East in general. Early this month, the firm will send to China Joseph J. Keegan and Hilliard J. Rosencrantz, who have been associated with American trade developments in the Far East for 16 years. These two representatives will establish offices and show rooms in Shanghai and will remain in the field as managing directors of the firm's Far Eastern division.

One of the principal departments of their activities will concern itself with railway equipment and supplies. It is the firm's plan to get in touch with American manufacturers, to pay cash for material bought here and to extend credit, through the firm's own facilities on the other side. The managing directors in the field will organize a selling force, recruited from experienced Americans and native Chinese already familiar with the trade. After the establishment of the office at Shanghai, branches will also be opened in other centers in China, and in Japan and the Dutch East Indies.

It is the desire of the firm to establish connections with American manufacturers whose lines are most suitable for construction in countries where practice is not established and in which the possibilities for new work are the greatest. They are particularly desirous of getting in touch with companies whose lines are of sufficient magnitude to require the maintenance of a technical man in China who would be under the direction of the banking firm, which would also guarantee the necessary credits.

Railway Construction

Green Bay & Eastern.—Contracts for grading this road, which will extend 72 miles from Green Bay, Wis., to Sheboygan via Manitowoc, will probably be let in March. The maximum amount of material to be handled per mile is estimated at 8,000 cu. yd. and the maximum grade at 2 per cent. Car shops will be built, but plans have not yet been prepared. The railroad intends to handle both freight and passenger traffic and will use gasoline electric power. W. M. Willinger, of Manitowoc, Wis., is president, and A. C. Lingelbach, of the same city, is chief engineer of the new railway.

MISSOURI, KANSAS & TEXAS.—This road is widening embankments on the Shawnee division between Oklahoma City, Okla., and Atoka, a distance of 133 miles. The contract for the teamwork has been awarded to A. L. Cook, of Ottawa, Kan., and a contract has been let to the List & Gifford Construction Company, of Kansas City, Mo., for the work which cannot be economically handled with teams. The latter company is operating two American ditchers in one train, each of the ditchers working between two 14-yd. dump cars with a spreader. The maximum amount of material handled per mile is about 8,000 cubic yards although some miles run very light.

MORGANTOWN & WHEELING (ELECTRIC).—This company is planning to build a line, it is said, between Price, W. Va., and Blacksville, 7.45 miles.

ONEIDA & WESTERN.—A contract is reported let to the Cook Construction Company to build an extension of 2.5 miles. The plans call for building a line from Oneida, Tenn., northwest to North Jamestown, 26 miles. A section of the line is completed and open for freight service. (April 16, p. 871.)

SAVANNAH & NORTHWESTERN.—A contract is reported let to Thomas Worthington, Birmingham, Ala., to build the Savannah & Atlantic from St. Clair, Ga., northwest to Warrenton, about 30 miles. (December 31, p. 1262.)

Washington & Lincolnton.—A contract is reported let to the Morrow Construction Co., Greenville, S. C., to grade the first 10 miles of a line from Washington, Ga., northeast to Metasville. J. R. Dyson, president, and H. W. Quin, secretary and treasurer, Washington, Ga.

WHEELING & LAKE ERIE.—A contract is reported let to the Casey Contracting Company, Pittsburgh, Pa., to build a three-mile spur line to circle east boundaries of Canton, Ohio.

RAILWAY STRUCTURES

COWAN, TENN.—The Nashville, Chattanooga & St Louis has completed about 90 per cent of the track laying work in progress at the yards and north of them About 3 miles of track are being laid by company forces at an estimated cost of \$35,000. A contract has been awarded to the Roberts & Schaefer Company, of Chicago, for a reinforced concrete, balanced bucket type of coaling station, to be operated by electricity and to serve 4 tracks. Its capacity will be 250 tons and its cost \$13,859. (Dec. 10, 1915, p. 1113.)

La Cross, Wis.—The Chicago, Milwaukee & St. Paul will ask bids on a 28,000-ton ice house some time this week. It will be a frame structure 48 ft. by 168 ft., with a composition roof and will cost about \$12,000. The foundation has been built by company forces and the material for the superstructure will also be furnished by the company.

NIAGARA FALLS, N. Y.—The grade crossing commission has completed arrangements for the elimination of three grade crossings in Niagara Falls. J. L. Harper, chief engineer for the Hydraulic Power Company, will be supervising engineer of the work. The city will pay \$190,000 and the railroads will pay a like amount of the cost of this improvement.

RICHMOND HILL, N. Y.—The Long Island Railroad will start work early this year on the elimination of five grade crossings in Richmond Hill. The cost of the improvements will be about \$500,000.

Railway Financial News

ERIE.—Directors have voted to offer \$20,000,000 series C convertible 4 per cent bonds to the extent of 10 per cent of their holdings to stockholders. Holders of outstanding convertible B's are also privileged to subscribe in the same proportion. The bonds are offered at 85 and are convertible after 1917 and until 1928 into stock at 50. The issue has been underwritten by a syndicate headed by J. P. Morgan & Co., New York, for a commission of 3 per cent.

George F. Brownell, vice-president in charge of the legal and financial departments, has been elected a director.

MINNEAPOLIS & St. Louis.—Arrangements are nearly completed for a syndicate to buy the collateral under the \$2,500,000 Minneapolis & St. Louis 2-year 6 per cent notes, due February 1, 1916. This collateral consists of \$5,500,000 par value Minneapolis & St. Louis refunding 5 per cent bonds due 1962.

MISSOURI PACTFIC.—The protective committee representing the Dutch holders of the collateral trust gold loan 4 per cent bonds has approved of the reorganization plan.

Southern Pacific.—Negotiations are being conducted by Kuhn, Loeb & Co. to take the 250,000,000 francs (\$50,000,000) Central Pacific 4 per cent 35-year European loan.

St. Louis & San Francisco.—The Missouri Public Service Commission has approved some of the features of the St. Louis & San Francisco reorganization plan, but has disapproved of the arrangement for having a voting trust.

Texas & Pacific.—The property of the Texas & Pacific in the state of New York has been attached by George J. Gould and the other executors of the Jay Gould estate for \$1,741,000. The attachment is granted for the purpose of recovering the amount said to be due on March 1, 1914, to the St. Louis, Iron Mountain & Southern, which is included in the assets of the Jay Gould estate.

A stockholders' protective committee has been formed as follows: Alvin W. Krech, president of the Equitable Trust Company, New York, chairman; Edgar L. Marston, Dunlevy Milbank, Winslow S. Pierce and Henry R. Ickelheimer.

WABASH-PITTSBURGH TERMINAL.—H. P. Goldschmidt & Co. and Sutro Brothers & Co., who have formed a syndicate to underwrite the cash requirements of the reorganization of the Wabash-Pittsburgh Terminal, announce that the syndicate has been closed and that no further subscriptions will be received.

Indian Railways.—Freight trains, consisting entirely of bogie trucks, constructed and equipped to meet economic conditions, have been introduced upon the Great Indian Peninsula Railway. The cars are of large carrying capacity, and can be loaded to 40 tons, or even 45 tons upon a road bed, which will carry the axle load. They have oil axle boxes, screw couplings, automatic vacuum brakes, as well as powerful side hand-lever brakes. The carrying capacity of a train is 1,200 tons of cotton at 40 tons per truck. If loaded at 45 tons per truck, the train will carry 1,350 tons. The tare weight is 570 tons behind the tender, including a 20-ton rear brake, and the total length over buffers, excluding the locomotive, is 1,340 ft.—Engineering, London.

CONGO RAILWAYS.—In an official British consular report just published it is stated that during the year 1913 about 60 miles of railway were added to the lines already in existence, which are approximately as follows: Matadi-Leopoldville (the entrance to the Upper Congo), 398; Stanleyville-Ponthierville, 125; Kindu-Kongolo, 350; Elisabethville-Kambove, 168; Kabolo-Tanganyika, The Kabolo-Tanganyika line, which is Belgian, is being constructed as a means of connection via Lake Tanganyika with the Kigoma-Dar-es-Salaam Railway. At the end of 1913 the construction had been completed to within 50 miles of Lake Tanganyika. When finished it will be a line of great importance, for it will be the means of supplying the Upper Congo from the east coast of Africa with all European requirements and at a far less cost than those now supplied through the port of Matadi. It will also tap the recently-discovered coalfields which are shortly to be opened in the neighborhood.